

Contributions from the Department of Botany of Columbia University—
No. 235.

The North American Species of the Genus *Ipomœa*.

By

Homer Doliver House, B. S., M. A.

Submitted in Partial Fulfillment of the Requirements for the Degree of Philosophy in the Faculty of Pure Science of Columbia University.

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THE NORTH AMERICAN SPECIES OF THE GENUS IPOMŒA.¹

BY HOMER DOLIVER HOUSE, B. S., M. A.

INTRODUCTION.

A comparative study of specimens of the *Convolvulaceæ*, representing the species placed by Linnæus² in *Ipomœa* and *Convolvulus*, shows that the two groups as there constituted, are far from homogeneous. The type of *Convolvulus* is *Convolvulus major albus*, Tournefort, pl. 17=(*Convolvulus sepium* L.). The species included in *Ipomœa* by Linnæus do not accord, except in part, with the diagnosis given by him in the *Genera Plantarum* (1737), where it is stated that the stamens are exserted, and pl. 39 of Tournefort³ is cited. This is *Quamoclit foliis tenuiter incisis & pinnatis* (= *Ipomœa quamoclit* L.). Under most circumstances this would establish it as the type of the genus, but it must be remembered that the genus *Quamoclit* was an accepted and valid genus before Linnæus called it *Ipomœa* and the genus has since been restored to generic rank by Moench.⁵ In the 5th. edition of the *Genera Plantarum* (1752), the Tournefort reference to pl. 39 is still retained, with the addition of "*Volubilis* Dill. Elth. 318." The first species figured by Dillenius under *Volubilis* is *V. zeylanica pes-triginus*, pl. 318. f. 411. (= *Ipomœa pes-triginus* L.)

In deference to historical usage and long continued uniformity, the writer does not believe it necessary to restrict *Ipomœa* to the group of species typified by *Ipomœa quamoclit* L., but is inclined to accept the species first figured by Dillinius under *Volubilis*, if it is necessary to designate a type for the genus *Ipomœa*. Without doubt the plant of greatest economic importance is *Ipomœa batatas* (L.) Lam. but as that was placed in *Convolvulus* by Linnæus and was known as *Batatas*⁴ in pre-Linnæan literature, it has nothing to recommend it as an acceptable type of the genus. If *I.*

¹ Presented in abstract to the Academy at the regular meeting on 9 March, 1908. Manuscript delivered to Secretary 10 March, 1908.

² *Species Plantarum*, 1753; ed. 2, 1762-63.

³ *Institutiones rei Herbariæ*, 1700.

⁴ Rumph. Amb. 5: 367. pl. 130. 1750.

⁵ Moench, Meth. 453. 1794.

quamoclit were to be recognized as the type of *Ipomœa*, the present genus *Quamoclit*¹ would have to take the name *Ipomœa*. This would cause a most sweeping change of names, which would be neither logical nor conducive to the future stability of its nomenclature.

No historical review of the genus will be attempted here, but the citations of species and synonyms is made as complete as possible, with the object of supplying the absence of a bibliography and historical sketch of the genus, and its divisions. The treatment of the genus *Ipomœa* in the following pages is in many respects similar to that of Choisy,² Meissner,³ Grisebach,⁴ and Asa Gray.⁵ The writer includes *Batatas* Choisy, *Pharbitis* Choisy, *Leptocallis* G. Don and *Bombycospermum* Presl, in *Ipomœa*; while the following genera are excluded as worthy of generic rank, *Operculina* S. Manso, *Quamoclit* (Tourn.) Moench, (incl. *Mina* Llav. & Lex.), *Exogonium* Choisy, *Calonyction* Choisy, *Turbina* Raf. and *Rivea* Choisy.

The writer is under deep obligations, for valuable suggestions and aid, to Dr. N. L. Britton of the N. Y. Botanical Garden; Dr. J. N. Rose and Mr. J. H. Painter of the U. S. National Museum; Dr. B. L. Robinson and staff of the Gray Herbarium of Harvard University.

The revision of the genus here presented is based upon the collections in the following institutions, the letter preceding each being used to indicate the locations of the specimen in the citation of specimens in the following pages.

(N). National Herbarium, U. S. National Museum, Washington, D. C.

(Y). New York Botanical Garden, New York, N. Y.

(C). Columbia University Herbarium in the N. Y. Botanical Garden.

(G). Gray Herbarium of Harvard University, Cambridge, Mass.

(M). Museo Nacional Mexicana, Mexico City, Mex. (Herb. Manual Urbina).

(J). Dept. of Agriculture, Jamaica; Hope Gardens, Jamaica, B. W. I.

SYNOPSIS OF THE GENUS IPOMŒA.

IPOMŒA L. Sp. Pl. 159. 1753.

Annual or perennial climbing or trailing vines or sometimes upright shrubby or tree-like plants. Leaves alternate; blades entire, angled, lobed

¹ Moench, Meth. 453. 1794.

² In DeCandolle Prodrômus 9: 335-396. 1845.

³ Meissner, in Mart. Fl. Bras. 7: 200-370. 1869.

⁴ Fl. Br. West Indies, 466-476. 1861.

⁵ Syn. Fl. N. Am. 2: 207-224. 1878.

or divided, usually petioled. Flowers solitary on axillary peduncles or in cymes, rarely in raceme-like clusters. Sepals 5, membranaceous or rather fleshy, sometimes becoming leathery, often herbaceous, closely imbricated, sometimes elongated. Corolla funnelform or funnelform-campanulate, rarely salverform, the tube often constricted within the calyx, the limb usually spreading, the plicæ ending at the middle of the margin of each lobe, rarely between the lobes. Stamens 5, included, rarely exserted. Ovary 2-, 3-, 4- or rarely 5-celled. Styles united. Capsule mostly septifragally 2-, 3-, 4- or 5-valved, sometimes thick-walled and elongated. Seeds glabrous, pubescent or hirsute on the angles, often with a long wool-like coma on the dorsal angles.

Key to the Sections of Ipomœa.

- Plants erect, stout, perennial, shrubby or tree-like;
leaf-blades rarely cordate. SECTION I. ORTHIPOMŒA.
- Plants twining, creeping or prostrate, stout or
slender; leaf-blades often cordate.
- Sepals herbaceous, often elongated and hairy;
ovary usually 3-celled. SECTION II. PHARBITIS.
- Sepals coriaceous, membranaceous or sub-
herbaceous; rarely elongated; ovary usu-
ally 2- or 4-celled. SECTION III. BATATAS.

Key to the Subsections.

I. ORTHIPOMŒA.

- Shrubby below or with stout, erect or ascending herbaceous
stems.
- Sepals lanceolate, acuminate; plant silvery. 1. *Argyrophyllæ*.
- Sepals ovate or ovate-oblong, usually obtuse or acute;
foliage not silvery but often pubescent. 2. *Leptophyllæ*.
- Arborescent, erect and woody. 3. *Arborescentes*.

II. PHARBITIS.

- Inflorescence densely capitate or leafy-bracted. 4. *Cephalanthæ*.
- Inflorescence not conspicuously bracted or capitate.
- Ovary typically 3- or 5-celled.
- Outer sepals becoming different from the inner ones, cor-
date or truncate and often conspicuously broadened
at the base. 5. *Heterophyllæ*.
- Sepals not becoming cordate or truncate nor conspicu-
ously enlarged in fruit.

- | | |
|---|-------------------------|
| Leaf-blades entire or variously 3-lobed. | 6. <i>Hederaceæ</i> . |
| Leaf-blades palmately 5-divided. | 7. <i>Cissoides</i> . |
| Ovary typically 2-celled; blades often 3-lobed. | 8. <i>Tyrianthinæ</i> . |

III. BATATAS.

- | | |
|---|----------------------------|
| Stems prostrate or creeping, not twining. | 9. <i>Erpipomœa</i> . |
| Stems trailing or twining, at least the tips twining. | |
| Seeds with dorsal or marginal coma longer than the seed or completely covered with long hairs (<i>Eriospermæ</i>). ¹ | |
| Leaf-blades divided to the petiole into 3 to 9 stalked or sessile leaflets. | 10. <i>Dactylophyllæ</i> . |
| Leaf-blades entire or, if lobed, not divided to the petiole. | |
| Pedicels thickened and fleshy, beset with tentacular outgrowths or setæ. | 11. <i>Setosæ</i> . |
| Pedicels not conspicuously thickened, neither tentacular nor setaceous. | |
| Inflorescence racemose, suberect or pendant; seeds covered on all surfaces with long wool-like hair. | 12. <i>Bombycospermæ</i> . |
| Inflorescence cymose, paniculate or the flowers solitary; seeds with dorsal or marginal hairs only. | |
| Leaf-blades deeply 5-lobed. | 13. <i>Palmatæ</i> . |
| Leaf-blades entire or 3-lobed, rarely 5-lobed. | 14. <i>Jalapæ</i> . |
| Seeds glabrous or pubescent, at least without a conspicuous coma (<i>Leiospermæ</i>). | |
| Leaf-blades palmately or pedately lobed nearly or quite to the petiole; stems slender. | 15. <i>Pedatisectæ</i> . |
| Leaf-blades entire, toothed or 3- to 5-lobed. | |
| Sepals small, less than 5 mm. long. | 16. <i>Microsepalæ</i> . |
| Sepals larger, 6-20 mm. long, or longer. | |
| Sepals thin and membranaceous, mostly obtuse, unequal; roots enlarged and tuber-like, | 17. <i>Emeticæ</i> . |
| Sepals coriaceous; roots rarely tuber-like. | |
| Sepals very unequal. | 18. <i>Anisomeræ</i> . |
| Sepals equal or nearly so. | 19. <i>Aquisepalæ</i> . |

SECTION I. ORTHIPOMŒA.

Erect, bushy, shrubby or tree-like perennials; leaf-blades rarely cordate or lobed; often short-petioled; corollas mostly large and showy; sepals coriaceous or leathery; capsules thick-walled, often elongated; seeds with long wool-like hair on the dorsal angles, or the angles long-hirsute.

¹ In cases where it has not been possible to determine with any certainty whether the seeds are hairy or not, the species has been grouped with the *Leiospermæ*.

1. **Argyrophyllæ.** Plants silvery-pubescent and more or less tomentose; sepals acuminate, lanceolate; corolla white. (*Ipomæa* § *Argyrophyllæ* Baker & Rendle, in T. Dyer, Fl. Trop. Afr. 4²: 135. 1905.)

One species in North America.

1. *I. ciervensis*.

1. *Ipomæa ciervensis* Painter; House, Bot. Gaz. 43: 408. 1907.

Shrubby below, 30–60 cm. high, densely silvery-pubescent throughout except the corolla; leaf-blades sessile or nearly so, oblong-lanceolate, acute or obtuse and somewhat 3-lobed, 4–6 cm. long; peduncles 1 cm. long; bracts linear-spatulate or subfoliaceous; sepals ovate-lanceolate, attenuate, about 15 mm. long; corolla white, about 6 cm. long, pubescent without in bud and strigulose on the plicæ when expanded.

TYPE LOCALITY: Hacienda Ciervo, Queretaro, Mexico.

DISTRIBUTION: Known only from the type locality.

SPECIMENS EXAMINED: *Rose, Painter & Rose 9660*, 1905 (type — N, Y). *Allamirano 1557*, 1905 (N).

2. **Leptophyllæ.** Foliage pubescent or glabrous, not silvery; leaf-blades entire (divided in *I. Pringlei* & *I. ancisa*); sepals coriaceous, ovate to ovate-lanceolate, obtuse; corolla large, purple or white. (*Ipomæa* § *suffruticosa* Choisy, in DC. Prodr. 9: 353. 1845.)

Corolla white or cream-colored.

Sericeous-pubescent; outer sepals much shorter than the inner.

2. *I. petrophila*.

Glabrous or nearly so.

Leaf-blades linear-lanceolate to oblong-lanceolate; sepals subequal.

3. *I. longifolia*.

Leaf-blades pinnately divided, 5–10 cm. long, sepals very unequal.

8. *I. ancisa*.

Corolla purple, lilac or pink.

Plant pubescent or hirsute.

Leaf-blades subsessile, hastately toothed at the base.

Sparingly pubescent; sepals 10–15 mm. long.

4. *I. stans*.

Densely pubescent; sepals suborbicular, 8–10 mm. long.

5. *I. jaliscana*.

Leaf-blades not toothed at the base.

Leaves 2 cm. long or more; sepals acute, 8–13 mm. long.

6. *I. durangensis*.

Leaves less than 1 cm. long, woolly-white; sepals obtuse, 5–6 mm. long.

9. *I. lenis*.

Plant glabrous or nearly so.

Leaf-blades pinnately divided, 2–4 cm. long.

7. *I. pringlei*.

Leaf-blades entire, linear-lanceolate.

10. *I. leptophylla*.

2. *Ipomœa petrophila* House, Bot. Gaz. 43: 401. 1907.

Stems erect from a large root, pale and finely tomentulose above, 30–60 cm. high; leaf-blades lanceolate, 4–10 cm. long, 3-nerved and obtuse at the ends, finely sericeous pubescent beneath; sepals unequal, oblong, obtuse, the inner ones 8–11 mm. long; corolla white with a pale purple throat, 6–8 cm. long, glabrous; the peduncles 1–3-flowered, 1–5 cm. long; capsules ovoid-conical, 14–16 mm. high, thick-walled.

TYPE LOCALITY: Near Chihuahua, Mexico.

DISTRIBUTION: Rocky hills, northern Mexico.

SPECIMENS EXAMINED: *Pringle 340*, 1885 (type — N). *Santa Eulalia plains, Wilkinson*, 1885 (N).

3. *Ipomœa longifolia* Benth. Pl. Hartw. 16. 1839.— Small, Fl. South-eastern U. S. 962. 1903.

Convolvulus Schumardianus Torr. Bot. Marcy's Rep. 291. 1853.

Ipomœa Carletoni Holzinger, Contr. Nat. Herb. 1: 211. 1892.

Convolvulus Queretanensis Sesse & Moc., Fl. Nov. Hisp. in La Naturaleza II. 1: 27. 1887.— Fl. Mex. l. c. II. 2: append. 36. 1893.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Prairies and plains, Oklahoma and Texas to Arizona and south in Mexico to Queretaro and Durango.

ILLUSTRATIONS: Bot. Reg. pl. 21. Contr. Nat. Herb. 1: pl. 17.

SPECIMENS EXAMINED: Oklahoma: *Carleton* (N); *Blankinship* (G). New Mexico: *Wright 1617*, 1851. Arizona: *Toumey 2580* (Y); *Lemmon 2834*; *Wilcox 375*. Mexico: Durango, *Palmer 229* (Y, N). Sonora: *Thurber 710*. Queretaro: *Rose, Painter & Rose 9544* (N, Y); *Hartweg 97* (G). Chihuahua: *Palmer 297*. Aguas Calientes: *E. W. Nelson 3887*.

4. *Ipomœa stans* Cav. Ic. 3: 26. 1794.— Choisy in DC. Prodr. 9: 355. 1845.

Convolvulus stans H. B. K. Nov. Gen. & Sp. 3: 96. 1819.

Convolvulus firmus Spreng. Syst. 1: 613. 1825.

Convolvulus sinuatus Sesse & Moc., Fl. Nov. Hisp. in La Naturaleza II. 1: 24. 1887.— Fl. Mex. l. c. II. 2: append. 38. 1893.

TYPE LOCALITY: Matritense.

DISTRIBUTION: Northern and western Mexico.

ILLUSTRATIONS: Cav. l. c. pl. 250. Altamirano, Mat. Mex. pl. 282.

Specimens examined from Coahuila, San Luis Potosi, Guanajuato, Hidalgo, Valley of Mexico, Orizaba and Oaxaca.

5. *Ipomœa jaliscana* House, *Muhlenbergia* 3: 39. 1907.

Ipomœa stans var. *hirsuta* Robinson, *Proc. Am. Acad.* 29: 319. 1894.

Differs from *I. stans* by its more conspicuously hirsute stems and leaves, the sessile leaf-blades which are relatively broader and more deeply lobed at the base; sepals suborbicular, 6–8 mm. long.

TYPE LOCALITY: Rio Blanco, Jalisco.

DISTRIBUTION: Jalisco.

SPECIMENS EXAMINED: *Palmer* 324, 1886 (type—G, N, C). *Pringle* 4438, 1893 (G, N).

6. *Ipomœa durangensis* sp. nov.

Stems erect, 50 cm. tall, finely sericeous-pubescent, densely so above, silvery on young parts; leaf-blades elliptical-oblong, 2–3 cm. long, 5–15 mm. wide, obtuse; peduncles 1 cm. long or less, 1-flowered; sepals subequal, lanceolate, acute, 8–13 mm. long, densely silky-pubescent; corolla slender funnelform, 6–7 cm. long, violet-purple with a white tube, plicæ pubescent without, the limb 5–6 cm. broad; sepals enlarged in fruit with subspatulate tips (not accrescent); capsules globose-ovoid, subacute, 15 mm. high, thick-walled, 2-celled; seeds minutely pubescent with a short coma of hairs on the dorsal angles.

MEXICO; Durango, *E. W. Nelson* 4639, 1898 (type, sheet No. 332692 — N, dupl. G), 4664, 1898 (N — 332718, G). *Palmer* 366, 1896 (N, Y, G).

7. *Ipomœa pringlei* A. Gray, *Proc. Am. Acad.* 22: 307. 1887.

? *Ipomœa sescossiana* Baillon, in *Bull. Soc. Linn. Par.* 1: 385. 1883.

Tall, erect and rigid; leaf-blades pinnately divided into 5–8 linear or filiform segments, 15–30 mm. long; peduncles stout, 1-flowered, as long as the leaves; sepals oblong, rounded, 7–8 mm. long; corolla blue or purple, 6–7 cm. long; capsules ovoid, 12–14 mm. high on reflexed pedicels, 2-celled; seeds tomentulose with an inconspicuous coma on the dorsal angles.

TYPE LOCALITY: Chihuahua.

DISTRIBUTION: Hilly regions of northern Mexico.

SPECIMENS EXAMINED: Chihuahua, *Pringle* 782, 1886 (type—G, N, Y). 579, 1885 (G). *E. W. Nelson* 6276, 1899 (N). Durango, *E. W. Nelson* 4729, 1898 (N).

8. *Ipomœa ancisa* sp. nov.

Resembling *I. Pringlei*; leaf-blades 5–10 cm. long, the segments filiform, 2–5 cm. long, .5–1.5 mm. wide; peduncles very stout, 6–11 cm. long, 1-flowered; sepals very unequal, orbicular-ovate, obtuse, with scarious margins; corolla slender-funnelform, white, 7–8 cm. long, the limb 6–7 cm. broad.

MEXICO: Chihuahua, between Colonia Garcia and Pratt's ranch, below Pacheco, *E. W. Nelson* 6276, 1899 (type, sheet No. 359993—N).

9. *Ipomœa lenis* sp. nov.

A dwarf, perennial, shrubby plant with thickened, woody base; stems erect, 10–30 cm. tall, densely woolly or silky pubescent with white hairs; leaf-blades sessile, oblong, obtuse at both ends, 6–10 mm. long, 2–4 mm. broad; flowers solitary in the upper axils and often crowded; peduncles 5–8 mm. long; sepals equal, ovate-lanceolate, obtuse, 5–6 mm. long, the outer ones silvery-pubescent; corolla funnelform, 5–6 cm. long, blue, glabrous, the limb 4–5 cm. broad, 5-lobed.

MEXICO: Zacatecas; Near Berriozobal, *E. W. Nelson* 3889, July 8, 1896 (type, sheet No. 266883—N, dupl. G).

10. *Ipomœa leptophylla* Torr. in Frem. Rep. 95. 1845.—Emory, Rep. *pl.* 11.—Morris in Plant World 7: *pls.* 5 & 6.—Small, Fl. Southeastern U. S. 964. 1903.—Roth. Bot. Wheeler 205. 1878.

Convolvulus Caddoensis Buckley in Proc. Phila. Acad. 1862: 6. 1862.

TYPE LOCALITY: Upper Platte.

DISTRIBUTION: Dry soil, plains of South Dakota and southeastern Montana to Texas and New Mexico.

3. **Arborescentes.** Erect, woody, arborescent or shrubby perennials, often several m. tall; leaf-blades oblong-ovate to narrowly or triangular-ovate, rounded, truncate or subcordate, rarely subsagittate at the base; sepals coriaceous, obtuse; corolla white, rarely pink or purple; capsules narrowly ovoid, or oblong; the coma of hairs on the seeds very long. (*Ipomœa* Sect. *Orthipomœa*, § *Arborescentes*, Choisy in DC. Prodr. 9: 358. 1845.

Seeds with black coma on all surfaces.

Twigs and leaves puberulent or glabrous; leaf-blades cordate-sagittate or truncate.

Leaf-blades oblong, acuminate.

11. *I. fistulosa*.

Leaf-blades ovate, short-acuminate.

12. *I. glabriuscula*.

Twigs and leaves densely canescent; leaf-blades ovate-cordate.

13. *I. nicaraguensis*.

Seeds with white coma only on the dorsal angles.

Corolla and sepal densely woolly without.

14. *I. murucoides*.

Corolla and sepals pubescent or glabrous, not woolly.

Foliage more or less densely pubescent; veins prominent beneath on the blades.

Leaf-blades ovate, cordate.

15. *I. arborescens*.

Leaf-blades, oblong, rounded at the base.

16. *I. cuernavacensis*.

Foliage glabrous or nearly so.

Sepals hairy within, 12–16 mm. long.

17. *I. intrapilosa*.

Sepals glabrous within and without.

Leaf-blades 2–3 cm. long; sepals 8–10 mm. long.

18. *I. calva*.

Leaf-blades 7–13 cm. long; sepals 10–12 mm. long.

19. *I. wolcottiana*.

11. ***Ipomœa fistulosa*** Mart.; Choisy in DC. Prodr. 9: 349. 1845.—
Meissn. in Mart. Fl. Bras. 7: 239. *pl.* 81. 1869.—Rose, in
Gard. & For. 7: 366. 1894.—Small, Fl. Southeastern U. S.
1963. 1903.

Batatas crassicaulis Benth. Bot. Voy. Sulphur 134. 1844.

Ipomœa texana Coulter, Contr. Nat. Herb. 1: 45. 1890.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Southern Mexico to Central America, Brazil and Peru, chiefly along rivers near the coast. Adventive northward to Texas and South Carolina.

Specimens examined from South Carolina, Texas, Vera Cruz, Chiapas, Acapulco, Tepic, Guatemala and Nicaragua.

12. ***Ipomœa glabriuscula*** House, Bot. Gaz. 43: 409. 1907.

Resembling the preceding, but glabrous; leaf-blades ovate, shallowly-cordate, minutely pubescent beneath; peduncles 4–12 cm. long; sepals unequal, the inner 6–7 mm. long; corolla white, glabrous or nearly so without.

TYPE LOCALITY: Guatemala.

DISTRIBUTION: Guatemala.

SPECIMENS EXAMINED: *Heyde*, 1892 (type — N, 256072).

13. ***Ipomœa nicaraguensis*** House, Bot. Gaz. 43: 409. 1907.

Ipomœa fistulosa var. *nicaraguensis* Donnell Smith, Bot. Gaz. 19: 256. 1894.

Twigs velvety-canescant; leaf-blades broadly ovate or reniform-ovate, velvety-canescant beneath, acute, shallowly cordate, 7–12 cm. long; sepals broadly ovate, rounded, minutely tomentose, 7 mm. long; corolla pink or whitish, tomentose without on the plicæ and tube.

TYPE LOCALITY: Río de las Lajas, Nicaragua.

DISTRIBUTION: Central America.

SPECIMENS EXAMINED: *W. C. Shannon* 5026, 1893 (type — N).

14. *Ipomœa murucoides* Roem. & Schult. Syst. 4: 248. 1819.

Convolvulus macranthus H. B. K. Nov. Gen. & Sp. 3: 95. 1818.

Ipomœa macrantha G. Don, Gen. Syst. 4: 267. 1838. Not *I. macrantha* Roem. & Schult. 1819.

Convolvulus strictus Willd.; Steud. Nom. ed. 2, 1: 412. 1841.

A large tree, the inflorescence and young parts densely tomentose or woolly; leaf-blades oblong-lanceolate, 7-12 cm. long, rounded or obtuse at the base, long-acuminate, tomentose beneath; calyx woolly without and pubescent within; the unequal sepals 18-28 mm. long; corolla 7-8 cm. long, woolly-pubescent without; capsules 25 mm. long; seeds with a long coma of white hairs on the dorsal angles and apex.

TYPE LOCALITY: Near Guanajuato and Santa Rosa, Queretaro, Mexico.

DISTRIBUTION: Hillsides, southern Mexico and Central America.

Specimens examined from Oaxaca, Morelos, Michoacan, Pueblo, Queretaro, Valley of Mexico, Guanajuato and Guatemala.

15. *Ipomœa arborescens* (Humb. & Bonpl.) G. Don, Gen. Syst. 4: 267. 1838.

Convolvulus arborescens Humb. & Bonpl.; Willd. Enum. 1: 204. 1809.—H. B. K. Nov. Gen. & Sp. 3: 94. 1818.

C. arboreus Balb.; Steud. Nom. ed. 2, 1: 407. 1841.

Argyrea oblonga Benth. Bot. Sulph. 133. 1844.

Ipomœa murucoides var. *glabrata* Rose, Contr. Nat. Herb. 1: 107. 1891.

Convolvulus Quanzhtzahuath Sesse & Moc., Fl. Nov. Hisp. in La Naturaleza II. 1: 23. 1887. Fl. Mex. l. c. II, 2: append. 36, 37. 1893.

Leaf-blades finely velvety-pubescent above, paler, densely pubescent and prominently reticulate-veined beneath, ovate, cordate; sepals oval obtuse, 6-10 mm. long, tomentulose-pubescent within and without; corolla white, about 5 cm. long; capsules 2 cm. high; seeds black with a long reflexed white coma of hairs on the dorsal angles.

TYPE LOCALITY: America meridionali.

DISTRIBUTION: Dry hilly regions of western and southern Mexico.

ILLUSTRATIONS: Gard. & For. 7: p. 364. 1894.

Specimens examined from Sonora, Sinaloa and Morelos.

16. *Ipomœa cuernavacensis* House, Bot. Gaz. 43: 410. 1907.

Convolvulus arboreus Moc. & Sesse, Fl. Nov. Hisp. in La Naturaleza II. 1: 23. 1887. — Fl. Mex. l. c. 2: append. 38. 1893. Not *C. arboreus* Balb. 1841.

Closely related to the preceding, but the leaf-blades oblong, rounded at the base, long-acuminate, 10-15 cm. long and 5-6.5 cm. wide.

TYPE LOCALITY: Cuernavaca, Morelos, Mexico.

DISTRIBUTION: Morelos.

SPECIMENS EXAMINED: *Rose & Painter 6863*, 1903 (type—N).

17. *Ipomœa intrapilosa* Rose, in Gard. & For. 7: 367. 1894.

I. murucoides var. *glabrata* A. Gray, Proc. Am. Acad. 22: 440. 1887. Not *I. glabrata* Meissn. 1869.

Nearly glabrous throughout; leaf-blades triangular-ovate, short-acuminate, truncate or rounded at the base, 5–15 cm. long; calyx tomentose without in bud, becoming glabrate, pubescent within; sepals oval, subacute, 12–16 mm. long; corolla 4–5 cm. long, the limb 7–8 cm. broad; capsules ovoid, 2 cm. long; seeds with a long dorsal coma of white hairs.

TYPE LOCALITY: Chapala, Jalisco, Mexico.

DISTRIBUTION: Rocky hillsides, western and southern Mexico.

Specimens examined from Sonora, Acapulco, Jalisco, Oaxaca and Morelos. Type collected by *Palmer (No. 703)*, 1886, (N).

18. *Ipomœa calva* House, Bot. Gaz. 43: 410. fig. 1. 1907.

Leaves clustered near the ends of the branches, blades small, 2–3 cm. long, nearly glabrous; sepals 8–10 mm. long; corolla about 5 cm. long, white, glabrous.

TYPE LOCALITY: La Junta, Guerrero, Mexico.

DISTRIBUTION: Known only from the type locality.

SPECIMENS EXAMINED. *E. W. Nelson 6992*, 1903 (type—N).

19. *Ipomœa wolcottiana* Rose, in Gard. & For. 7: 367. 1894.

Nearly or quite glabrous; leaf-blades ovate, or ovate-lanceolate, 7–13 cm. long, rounded or truncate at the base, acuminate; sepals 10–12 mm. long; corolla white, 6–7 cm. long; capsules oblong, 18 mm. long.

TYPE LOCALITY: Manzanillo, Colima, Mexico.

DISTRIBUTION: Rocky hillsides western and southern Mexico.

ILLUSTRATIONS: Gard. & For. 7: p. 365. 1894.

SPECIMENS EXAMINED: Colima; Manzanillo, *Palmer 1342*, 1891, (type—N, G, Y). Puebla; *Rose & Hay 5880*, 1901 (N). Morelos, Cuernavaca, *Rose & Painter 6965*, 1903 (N). Chiapas; *E. W. Nelson 3509*, 1895 (N). Oaxaca; *E. W. Nelson 2361*, 1895 (N).

SECTION II. PHARBITIS.

Annual or perennial twining or trailing vines with herbaceous sepals, these often with elongated tips and more or less pubescent or hispid bases; capsules globose, thin-walled, 2-, 3- or 5-celled.

Nil Medicus in Staatw. Vorles. Churpf. Phys-Oak. Ges. **1**: 210. 1791.

Convolvuloides Moench, Meth. 451. 1794.

Ornithosperma Raf. Fl. Ludov. 149. 1817.

Cleimera Raf. Fl. Tellur. **4**: 77. 1838.

Pharbitis Choisy, in Mem. Soc. Phys. Genev. **6**: 438. 1833.— In DC. Prodr. **9**: 341. 1845.

4. Cephalanthæ. Stout, annual or perennial twiners; the inflorescence congested or capitate and subtended by herbaceous, usually pubescent or hairy bracts, or the pedicels very short and each subtended by a bract. (*Ipomœa*, Sect. *Strophipomœa* § *Cephalanthæ* Choisy, in DC. Prodr. **9**: 363. 1845.)

Sepals and bracts similar, hairy, not veined.

Stems minutely or softly pubescent or tomentose.

Leaf-blades silvery beneath; stems tomentose.

20. *I. maireti*.

Leaf-blades not silvery beneath, glabrous above and stems minutely pubescent.

21. *I. invicta*.

Stems retrorsely strigose-pubescent.

Corolla 7–9 cm. long; western Mexico.

22. *I. lambii*.

Corolla 3–4 cm. long; southern Mexico.

23. *I. hirtiflora*.

Sepals and bracts dissimilar; sepals veined.

Stems hirsute; peduncles longer than the pedicels.

24. *I. ruber*.

Stems glabrous; peduncles very short and usually shorter than the pedicels.

25. *I. fimbriosepala*.

20. Ipomœa maireti Choisy, in DC. Prodr. **9**: 374. 1845.

A stout, perennial vine, with densely tomentose stems; leaf-blades ovate, cordate, 7–12 cm. long, acute, finely pubescent above, densely silvery pubescent beneath; peduncles 1–3-flowered; bracts ovate, obtuse; sepals 18–22 mm. long, oblong-lanceolate, acute; corolla campanulate-funnelform, 7–8 cm. long, the limb blue, the tube white below, pubescent without.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Forests from Orizaba region to Oaxaca and Guatemala.

SPECIMENS EXAMINED: Zuzuapan, *Purpus* 2391, 1907 (Y). Valley of Cordova, *Borgeau* 1738, 1866 (G). Oaxaca, *E. W. Nelson* 2400 & 2471, 1895; *Conzatti & Gonzalez* 620, 1897 (G). Orizaba, *A. Gray*, 1885 (G). Guatemala, *Sutton Hayes*, 1860 (G).

21. *Ipomœa invicta* sp. nov.

A stout, woody twining vine; stems, petioles and peduncles minutely pubescent; leaf-blades ovate, cordate, acute or abruptly acuminate, 8–14 cm. long, glabrous above, pubescent beneath, principal veins about 6 pairs; petioles shorter than the blades; peduncles 6–10 cm. long, 2–3-flowered; bracts oblong-spatulate, 1–2.5 cm. long; pedicels 5–8 mm. long; sepals unequal, elliptical-oblong, acute or acuminate, 2.5–3 cm. long, often tinged with red above; corolla broadly funnelform, about 6 cm. long, blue, glabrous, white below on the plicæ and tube, the tube 1.5–2 cm. thick.

MEXICO: Jalisco; Vicinity of San Sebastian, 3850–5000 ft. alt. *E. W. Nelson* 4087, 1897 (type, sheet No. 327167—N).

22. *Ipomœa lambii* Fernald, Bot. Gaz. 20: 535. 1895.

Stems slender, covered with reflexed, tuberculate hairs; leaf-blades ovate, acuminate, 7–15 cm. long, often 3-lobed or subhastate, strongly pubescent beneath; peduncles 5–10 cm. long, 2–4-flowered; bracts elliptical-ovate, 2–2.5 cm. long; sepals ovate-lanceolate, 1.5–2 cm. long; corolla 7–9 cm. long, rose-purple.

TYPE LOCALITY: Near Zopelote, Tepic, Mexico.

DISTRIBUTION: Western Mexico.

SPECIMENS EXAMINED: *Lamb* 556, 1895 (type—G, Y, N).

23. *Ipomœa hirtiflora* Mart. & Gal. Bull. Acad. Brux. XII. 2: 264. 1845.—House, Muhlenbergia 3: 38. 1907.

Stout, twining, perennial; stems densely pilose with reflexed brownish hairs; leaf-blades orbicular-ovate, entire or 3-lobed, acute, densely appressed pubescent above, silky beneath, 6–12 cm. long, deeply cordate; peduncles 12–20 cm. long, several-flowered; bracts ovate-lanceolate, 2–2.5 cm. long; sepals narrowly lanceolate, acuminate, pilose, 16–22 mm. long; corolla purple, slender, about 5 cm. long and 3 cm. broad, pilose without on the plicæ and tube.

TYPE LOCALITY: Woods, Chinantla, Mexico.

DISTRIBUTION: Southern Mexico and Guatemala.

SPECIMENS EXAMINED: Near Jacaltenango, Guatemala, *E. W. Nelson* 3579, 1895, 3500–5400 ft. alt. (N).

24. *Ipomœa ruber* (Vahl) Millsp. Field Col. Mus. Bot. 2: 86. 1900.

Convolvulus ruber Vahl, Eclog. Am. 2: 12. 1798.

Ipomœa setifera Poir. Encyc. 6: 16. 1804.—Choisy in DC. Prodr. 9: 359. 1845.—

Hallier f. in Bot. Jahrb. 18: 143. 1893.

I. brevifolia G. F. W. Mey. Fl. Esseq. 100. 1818.

C. setifera Spreng. Syst. 1: 606. 1825.

Calystegia setifera Meissn.; Mart. Fl. Bras. 7: 316. 1869.

I. lesteri Baker, in Kew Bull. 83. 1892.

Ipomœa assumptionis Britt. Ann. N. Y. Acad. Sci. 7: 170. 1893.

TYPE LOCALITY: America meridionali.

DISTRIBUTION: West Indies, tropical South America and Africa.

ILLUSTRATIONS: Mart. Fl. Bras. 7: pl. 101. f. 2.

SPECIMENS EXAMINED: Jamaica, *Millsparagh* 946, 1899. Porto Rico, *Sintenis* 963, 1885; *Heller* 376, 1899; 6364, 1903; *Millsparagh* 146, 1899; *Britton & Cowell* 1392, 1906. Guadeloupe: *Duss* 2474, 1892. Martinique; *Duss* 430. All in herb. N. Y. Bot. Garden.

Urban describes the form with pale yellow flowers as *Ipomœa ruber* var. *albo-flavida* (Sym. Ant. 3: 345. 1902).

Ipomœa ruber var. *palustris* Urban, l. c. is described as having 1-flowered peduncles; bracts 6 mm. long, ovate; sepals prominently wing-keeled, crenulate; corolla 2.5-3 cm. long and leaf-blades elongated. Both are natives of Porto Rico, but the last variety is perhaps nearer the next.

25. *Ipomœa fimbriosepala* Choisy, in DC. Prodr. 9: 359. 1845.—
Hallier f. Bull. Soc. Bot. Belg. 37: 97. 1898.

Aniseia hastata Meissn.; Mart. Fl. Bras. 7: 319. 1869.

Ipomœa smithii Baker, Kew Bull. 73. 1894.

TYPE LOCALITY: Madagascar.

DISTRIBUTION: Tropical Africa, Pacific Islands and America. Reported from Guatemala, Brazil and Paraguay by Hallier; but no specimens from North America have been seen by the writer.

5. *Heterophyllæ*. Trailing or twining from thickened, tuberous, woody roots; more or less pubescent; leaf-blades deeply 3- to 5-lobed or subentire; flowers usually solitary on short peduncles; bracts small; sepals very unequal, the outer ones usually with broad, ovate bases, the inner narrower, the outer ones frequently truncate or subcordate, sometimes enlarged in fruit; corolla purple, funnelform: ovary 3-celled. (*Pharbitis* Choisy, in part.)

Sepals merely acute, not attenuate.

Leaf-blades deeply 3- to 5-lobed; sepals ovate, 20 mm.

× 12 mm.; corolla 8-9 cm. long.

26. *I. laeta*.

Leaf-blades hastate and subentire; sepals 10 mm. long; corolla less than 5 cm. long.

27. *I. oreophila*.

Sepals with attenuate tips.

Outer sepals linear-lanceolate without conspicuously broadened bases; corolla 6-8 cm. long.

28. *I. lindheimeri*.

Outer sepals with conspicuously broadened bases.

Appressed sericeous-pubescent; corolla 6-9 cm. long.

29. *I. heterophylla*.

Loosely pubescent with hispid, whitish pili, only the leaves loosely sericeous-pubescent; corolla 3-4 cm. long.

30. *I. pubescens*.

26. *Ipomœa læta* A. Gray, Proc. Amer. Acad. 22: 439. 1887.

Stems densely and softly pubescent; leaf-blades suborbicular, 3-5 cm. long, deeply 3-lobed, deeply cordate, lobes contracted below and the blade sometimes sub-5-lobed; peduncles about as long as the petioles; sepals oblong-ovate, acute, hirsute, rounded at the broad base, 2 cm. long; corolla 9-10 cm. long, pubescent without, pink-purple.

TYPE LOCALITY: Rio Blanco, Jalisco, Mexico.

DISTRIBUTION: Trailing among grasses and low plants. Jalisco.

SPECIMENS EXAMINED: *Palmer 341*, 1886 (type — G, N, C). Hills near Guadalajara. *Pringle 4456*, 1893 (G, N, C).

27. *Ipomœa oreophila* sp. nov.

Low and feebly twining, about 1 m. long from a woody root; stems and foliage glabrous or minutely pubescent; leaf-blades ovate-hastate or triangular-ovate, entire except for the spreading basal auricles which are 1-2-lobed or toothed; blades 3-5 cm. long, 2-4 cm. wide; peduncles slightly longer than the petioles; pedicels less than 1 cm. long; outer sepals similar to the leaf-blades in shape, pubescent, subherbaceous, triangular-ovate, hastate or subcordate, acute, 10-12 mm. long; corolla funnelform, 6 cm. long, the limb blue, the tube white below.

MEXICO: Hidalgo; Rocky hills, Lena Station, 8300 ft. alt. *Pringle 10034*, 24 Aug., 1905 (type — G, Y). Chiapas; Near San Cristobal, *E. W. Nelson 3149*, 1895 (233090 — N, G). Valley of Mexico; Mt. Zocoalco, Guadeloupe, *Borgeau 728 & 797*, 1866 (G).

28. *Ipomœa lindheimeri* A. Gray, Syn. Fl. N. Am. 21: 210. 1878.

Ipomœa heterophylla Torr. Bot. Mex. Bound. 149. 1859. Not *I. heterophylla* Ortega, 1800.

Pharbitis lindheimeri Small, Fl. Southeastern U. S. 964. 1903.

Foliage finely but densely appressed pubescent; leaf-blades deeply 3- to 5-lobed, the middle lobe with a contracted basal portion longer than the expanded part, lateral lobes similar; sepals linear-lanceolate, 2-2.5 cm. long; corolla 6-9 cm. long.

TYPE LOCALITY: Valley of the Rio Grande, below Donana.

DISTRIBUTION: Hills and prairies, Texas to New Mexico, and northern Mexico.

SPECIMENS EXAMINED: Western Texas; *Wright 508*, 990; *Schott*, 1851; *Jermy 185*; *Harvard*, 1881; *F. Tweedy 170*; *Reverchon 654*; Comache Spring, *Lindheimer 1031*, 1851; *Heller 1776*; *Bray 18*; *Earle & Tracy 150*; *Stanfield*, 1896. New Mexico: *Wright 1613*. Coahuila; *Palmer 906*, 1880. Chihuahua; *Pringle 1339*, 1887; *Townsend & Barber 220*, 1899.

***Ipomœa lindheimeri* subintegra var. nov.**

Leaf-blades entire or angled, shallowly cordate, acuminate, 1–4 cm. long; sepals ovate-lanceolate, 16–18 mm. long, 4–8 mm. broad; corolla 6–7 cm. long.

ARIZONA: Near Ft. Huachuca, *Lemmon 2835*, 1882 (type—G).

29. ***Ipomœa heterophylla*** Ortega. Hort. Matr. Dec. 1: 9. 1800.—Willd. Enum. Hort. Berol. 1: 207. 1809.¹

Ipomœa ortegæ Poir. Encyc. Suppl. 4: 633. 1816.

Ipomœa willdenowii Roem. & Schult. Syst. 4: 211. 1819.

Convolvulus heterophyllus Spreng. Syst. 1: 592. 1825.

Batatas heterophylla G. Don, Gen. Syst. 4: 261. 1838.

Batatas willdenowii G. Don, l. c.

Convolvulus willdenowii Steud. Nom. ed. 2. 1: 412. 1841.

Pharbitis heterophylla Choisy, in DC. Prodr. 9: 344. 1845.

Foliage appressed sericeous-pubescent; leaf-blades deeply 3- to 5-lobed; sepals with ovate or suborbicular densely hirsute bases and long attenuate tips, 20–24 mm. long, 10–15 mm. wide, enlarged in fruit; corolla 5–6 cm. long, the tube fully 10 mm. thick at the top of the calyx.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Dry places, northern Mexico to western Texas.

ILLUSTRATIONS: Jacq. Fragm. 37. pl. 42. f. 4.

SPECIMENS EXAMINED: San Luis Potosi, *Schaffner 426 & 619* (Y). Chihuahua; *E. W. Nelson 6159 & 6284*, 1899 (N).

***Ipomœa heterophylla æmula* var. nov.**

Sepals ovate-lanceolate, 20–25 mm. long, 6–8 mm. broad; corolla large, the tube 4 mm. thick at the base, 6–7 mm. thick above the calyx, subsalverform, the limb 6–7 cm. broad.

CHIHUAHUA: Hills near Guerrero, *Pringle 1339*, 1887 (type — G, Y, N).

***Ipomœa heterophylla subcomosa* var. nov.**

Stems and foliage very densely appressed sericeous-pubescent; peduncles 1–2 cm. long; outer sepals 15–18 mm. long at flowering time, 8–10 mm. broad at the truncate base, becoming twice as long and a half broader in fruit, the tips attenuate, tinged with red; corolla 6–7 cm. long, the tube only 2–3 mm. thick above the calyx, the limb 5 cm. broad.

DURANGO, *Palmer 590*, 1896 (type—N, G, Y).

¹ *Ipomœa heterophylla* R. Br. 1810. = *Ipomœa polymorpha* Roem. & Schult. 1819.

30. *Ipomœa pubescens* Lam. Tabl. Encyc. 1: 265. 1891.—Encyc. 6: 15. 1804.—Meissn. in Mart. Fl. Bras. 7: 224. 1869.

Convolvuloides pilosa Moench, Meth. 452. 1794.

Ipomœa Papiriu & subtriloba Ruiz. & Pav. Fl. Peruv. 2: 11. 1799.

Ipomœa varia Roth, Catal. 2: 17. 1800.

Convolvulus pubescens Willd. Enum. Hort. Berol. 1: 203. 1809.

Convolvulus Papiria Spreng. Syst. 1: 592. 1825.

Batatas Papirin & subtriloba G. Don, Gen. Syst. 4: 261. 1838.

Pharbitis varia, G. Don, l. c. 263.

Pharbitis pubescens Choisy, in DC. Prodr. 9: 344. 1845.

Stems retrorsely hispid and pubescent with long whitish pili; leaf-blades similar to the preceding but more hispid-pubescent; sepals narrowly ovate, acuminate, 15–18 mm. long, 7–8 mm. broad at the rounded or subcordate base, becoming 20 by 18 mm. in fruit; corolla 3–4.5 cm. long, the tube white, 7–8 mm. thick above the calyx, the purple 5-angled limb 2.5–5 cm. broad.

TYPE LOCALITY: America (Lam.); Prov. Tarma, Peru (Ruiz. & Pav.).

DISTRIBUTION: Stony hills, western Texas and Mexico to Peru and Bolivia.

ILLUSTRATIONS: Ruiz. & Pav. l. c. *pl.* 120. *f.* a.

SPECIMENS EXAMINED: Western Texas; *C. Wright* 509 (G). Mexico: *Dr. J. Gregg* 389, 1848–49 (G). Queretaro; *Pringle* 7194, 1896 (G). *Rose, Painter & Rose* 9541, 1905 (N). Durango; *E. W. Nelson* 4638, 4747 & 4962, 1898 (N). Hidalgo; *Purpus* 1393, 1905 (N, Y). *Rose, Painter & Rose* 8354, 1905 (N). Valley of Mexico; *Rose, Painter & Rose* 9541, 1905 (N, Y).

The above cited specimens are identical with *Rusby's* 1988, 1885, from near La Paz, Bolivia, which agrees in all particulars with the descriptions of Lamark and of Ruiz & Pavon.

6. **Hederaceæ.** Annuals or perennials, rarely with tuberous roots; stems and foliage usually pubescent or hirsute; peduncles usually several or many flowered; sepals equal or nearly so, broadest at or near the base, usually densely hispid and acute to acuminate or attenuate-caudate; corolla blue or white; ovary 3-celled or sometimes 5-celled.

Sepals acute, 8–15 mm. long.

Stems prostrate; ovary 5-celled; leaf-blades hastate-cordate or lobed; root tuberous.

31. *I. decasperma.*

Stems twining; ovary 3-celled, leaf-blades ovate.

Stems and leaves hirsute to glabrate.

Leaf-blades usually entire; corolla 4–6 cm. long.

32. *I. purpurea.*

Leaf-blades usually 3-lobed; corolla 2.5–3 cm. long.

33. *I. hirsutula.*

Stems and leaves densely and softly tomentose.

34. *I. jamaicensis.*

Sepals attenuate or caudate-attenuate.

Leaf-blades canescent, silvery or silky-white beneath at least when young.

Sepals pilose; leaf-blades silvery-canescens beneath. 35. *I. mutabilis*.

Sepals glabrous or nearly so; leaf-blades silky-pubescent, glabrate above with age. 36. *I. villosa*.

Leaf-blades hispid-pubescent to glabrate.

Tips of sepals caudate-spatulate, obtuse; corolla white. 37. *I. ampullacea*.

Tips of sepals caudate-acuminate; corolla blue.

Foliage pubescent or hirsute.

Sepals glabrous; 25–30 mm. long; leaf-blades hastately 5–7 lobed and cordate-hastate. 38. *I. thurberi*.

Sepals pubescent or hispid.

Leaf-blades entire, silky-pubescent. 39. *I. barbiger*.

Leaf-blades 3–5-lobed or angled; hispid-pubescent.

Tips of sepals linear-attenuate, hirsute or hispid at the base.

Bases of the sepals conspicuously broadened; lobes of the leaf-blades contracted below; corolla 2.5–3 cm. long.

Sepals densely hirsute; tips strongly spreading. 40. *I. hederacea*.

Sepals sparingly barbate with whitish hairs, tips not strongly spreading. 41. *I. desertorum*.

Bases of the sepals not conspicuously broadened, linear-lanceolate; lobes of the leaf-blades rarely contracted below; corolla 3–6 cm. long. 42. *I. Nil*.

Tips of sepals merely long-acuminate, erect, slightly pubescent.

Bracts 4–8 mm. long; sepals puberulent or sparingly pubescent. 43. *I. vahliana*.

Bracts 12–20 mm. long; sepals appressed pubescent with silvery hairs. 44. *I. Learii*.

Foliage and stems nearly glabrous or finely appressed-pubescent; sepals glabrous or nearly so, veined and merely acuminate, 16–20 mm. long. 45. *I. cathartica*.

31. *Ipomœa decasperma* Hallier f. Bull. Herb. Boiss. 5: pl. 14. 386. 1897.

Trailing from a large woody root; finely pubescent; leaf-blades orbicular-reniform, cordate-hastate, 2–4 cm. broad or sometimes 3- to 5-lobed; peduncles 1- to 3-flowered; sepals ovate, acuminate, 10–12 mm. long, hirsute; corolla purple, 5–6 cm. long; capsules globose, 10 mm. in diameter, 5-celled, 5- to 10-seeded, 5-valved.

TYPE LOCALITY: Valley of Mexico.

DISTRIBUTION: Rocky hillsides, central Mexico.

SPECIMENS EXAMINED: Near Durnago, Palmer 591 & 592, 1896 (N, Y, G).

32. *Ipomœa purpurea* (L.) Lam. Illus. 1: 466. 1791.—Roth, Catal. 27. 1797.—Britton, Manual 752. 1901.

Convolvulus calycibus tuberculatus pilosis, Vind. Cliff. 18.—Hort. Ups. 38.—Gronov. Virg. 141.—Roy. Lugdb. 428.

C. purpureus, folio subrotundo, Bauh. Pin. 295.—Ehret. Pict. 7. f. 2.

C. folio cordato glabro, Dill. Elth. 100.

C. caeruleus minor, folio subrotundo, Dill. Elth. 97.

Convolvulus purpureus L. Sp. Pl. ed. 2, 219. 1762.

Convolvulus mutabilis Salisb. Prodr. 123. 1796.

Ipomœa discolor Jacq. Hort. Schoenb. 3: 6. 1798.

Ipomœa glandulifera Ruiz. & Pav. Fl. Peruv. 2: 12. 1799.

Ipomœa hispida Zuccagni, in Roem. Coll. 127. 1806.

Ipomœa intermedia Schult. Obs. Bot. 37. 1809.

Convolvulus eriocallos Willd.; Roem. & Schult. Syst. 4: 301. 1819.

Convolvulus intermedius Roem. & Schult. l. c. 264.

Ipomœa Zuccagnii Roem. & Schult. l. c. 230.

Pharbitis hispida Choisy, in Mém. Soc. Phys. Genève. 6: 440. 1833.—In DC. Prodr. 9: 341. 1845.

Convolvulus Schultesii Roem. & Schult.; Steud. Nom. ed. 2, 1: 411. 1841.

Pharbitis purpurea Voigt. Hort. Suburb. Calc. 354. 1845.—Small, l. c. 964.

TYPE LOCALITY: America.

DISTRIBUTION: Thickets and waste places throughout tropical America. Cultivated and a frequent escape northward to Ontario and Nova Scotia.

ILLUSTRATIONS: Dill. Elth. pl. 84. f. 97. Jacq. Hort. Schoenb. pl. 261. Ruiz. & Pav. Fl. Peruv. pl. 121. f. a. Bot. Mag. pls. 113, 1005 & 1682. Weinmann, Phytanth. 2: pls. 414 & 415. Britt. & Brown, Illus. Fl. 3: f. 2949. Bailey, Cyclop. Am. Hort. f. 1167. Knorr. Thes. Hort. pls. 187 & 189.

33. *Ipomœa hirsutula* Jacq. f. Eclog. 1: 63. 1811–16.

Convolvulus flore purpureo, calyce punctato, Dill. Elth. 99.

Convolvulus hederaceus var. γ . L. Sp. Pl. 154. 1753. Ed. 2, 219. 1762. in part, as to the Dillenian citation above.

?*Ipomœa punctata* Pers. Syn. 1: 184. 1805. (excl. habitat).

Pharbitis diversifolia Lindl. Bot. Reg. 33: pl. 1988. 1837.

Pharbitis punctata G. Don, Gen. Syst. 4: 263. 1838.

P. Nil var. *diversifolia* Choisy, in DC. Prodr. 9: 343. 1845.

Ipomœa affinis Mart. & Gal. in Bull. Acad. Brux. XII. 2: 263. 1845.

Pharbitis cathartica Hook. Bot. Mag. pl. 4289. 1847. Not *P. cathartica* Choisy, 1845.

Ipomœa mexicana A. Gray, Syn. Fl. N. Am. 2¹: 210. 1878.

Convolvulus hederaceus Sesse & Moc. Fl. Nov. Hisp. in La Naturaleza II. 1: 22, 1887.—Fl. Mex. l. c. II. in. 2: append. 21. 1893.

Ipomœa hirta Th. Dur. in Bull. Acad. Bot. Belg. II. 27: 175. 1888.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Western Texas to Arizona, Central America and probably in South America.

ILLUSTRATIONS: Dill. Elth. *pl.* 83. *f.* 96. Jacq. *f.* Eclog. **1**: *pl.* 44. Hook. Bot. Mag. *pl.* 4289. Bot. Reg. *pl.* 1988.

Specimens examined from Texas, New Mexico, Arizona; Sonora, Jalisco, Chihuahua, Durango, Valley of Mexico, Aguas Calientes, Queretaro, Oaxaca, Mechoacan and Guatemala.

34. *Ipomœa jamaicensis* (Spreng.) G. Don, Gen. Syst. **4**: 278. 1838.
— Meissn. in Mart. Fl. Bras. **7**: 225. 1869.

Convolvulus folio lanato, etc. Sloan. Jam. 55.— Hist. **1**: 154.

Convolvulus tomentosus L. Sp. Pl. 156. 1753.

?*C. roseus* Mill. Dict. No. 18. 1768.

C. jamaicensis Spreng. Syst. **1**: 595. 1825. Not *C. jamaicensis* Jacq. 1768.

Pharbitis tomentosa Choisy, in DC. Prodr. **9**: 342. 1845.

Pharbitis jamaicensis Gib. Enum. Pl. Montev. 28. 1873.

Ipomœa tomentosa Urb. Sym. Ant. **3**: 344. 1902. Not *I. tomentosa* Choisy, 1845.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Jamaica to tropical South America.

ILLUSTRATIONS: Sloan. Hist. *pl.* 98. *f.* 2. Pluk. Alm. *pl.* 167. *f.* 4. Meissn. in Mart. Fl. Bras. **7**: *pl.* 77.

SPECIMENS EXAMINED: Jamaica: Great Goat Isl., *Harris 9212*, 1906 (Y).

35. *Ipomœa mutabilis* Lindl. Bot. Reg. **1**: 39. 1815.

Convolvulus mutabilis Spreng. Syst. **1**: 593. 1825. Not *C. mutabilis* Salisb. 1797.

Pharbitis mutabilis Boj. Hort. Maurit. 227. 1837.

Pharbitis dealbata Mart. & Gal. in Bull. Acad. Brux. XII. **2**: 272. 1845.

Ipomœa dealbata Hemsley, Biol. Cent.-Am. Bot. **2**: 386. 1882.

Ipomœa Learii Meissn. in Mart. Fl. Bras. **7**: 224. 1869. Not *I. Learii* Paxton, 1839.

Stems densely and softly pubescent; leaf-blades orbicular-ovate, entire or 3-lobed, 6–15 cm. long, appressed-pubescent above, silvery-canescient beneath; sepals linear-lanceolate, 10–15 mm. long, appressed silky-pilose; corolla 7–8 cm. long, blue with a white tube.

TYPE LOCALITY: Near Vera Cruz, Mexico.

DISTRIBUTION: Wooded slopes and mountain forests, Tamaulipas to Vera Cruz, Orizaba and Oaxaca to Brazil.

ILLUSTRATIONS: Bot. Reg. *pl.* 39.

SPECIMENS EXAMINED: Tamaulipas; Victoria, *Palmer* 201, 1907 (N, Y); Orizaba; *Karwinsky* 590, & 591, 1841-42 (Y). *Müller* 581 & 905, 1855 (C). *Botteri* 469 & 586 (Y, G); *Borgeau* 2212 & 2814, 1866 (G); *Seaton* 36 & 449, 1891. Vera Cruz; Jalapa, *Chas. L. Smith* 1791, 1894 (G). Oaxaca; Tentila, *Rev. Lucius C. Smith* 657, 1895 (G).

36. *Ipomœa villosa* Ruiz. & Pav. Fl. Peruv. 2: 12. 1799¹.—Griseb. Fl. Br. W. Ind. 473. 1864.—Lefroy in Jones & Goode, Nat. Hist. Bermuda 90. 1884.

Ipomœa congesta R. Br. Prodr. 1: 485. 1810.

Convolvulus congestus Spreng. Syst. 1: 601. 1825.

Convolvulus Ruizii Spreng. l. c. 594.

Pharbitis insularis Choisy in Mém. Soc. Phys. Genève. 6: 439. 1833.—In DC.

Prodr. 9: 341. 1845.

Ipomœa insularis Choisy; Steud. Nom. ed. 2, 1: 817. 1841.

Pharbitis rosea Choisy, in DC. Prodr. 9: 342. 1845.

TYPE LOCALITY: Peru.

DISTRIBUTION: Thickets near the sea shore, circumtropical and chiefly insular.

ILLUSTRATIONS: Ruiz. & Pav. l. c. *pl.*

SPECIMENS EXAMINED: Bermuda; *Kemp*, 1885; *Harshberger*, 1905, *Brown & Britton* 156, 1905. Socorro Id. (Pacific), *Barkelew* 245 (in part), 1903. Clarion Id. *A. W. Anthony* 403, 1897. Reported from Trinidad by Grisebach.

37. *Ipomœa ampullacea* Fernald, Proc. Am. Acad. 33: 89. 1897.

Stems woody below from a tuberous root, retrorsely hispid; leaf-blades entire or 3-lobed; sepals pubescent, 2.5-4 cm. long, ovate below, acuminate and becoming spatulate-attenuate with age; corolla white, 6 cm. long, pubescent without.

TYPE LOCALITY: Near Acapulco, Mexico.

DISTRIBUTION: Known only from the type locality.

SPECIMENS EXAMINED: Acapulco, *Palmer* 483, 1894-95 (type — G, Y, N).

38. *Ipomœa thurberi* A. Gray, Syn. Fl. N. Am. 2¹: 212. 1878.—In Proc. Am. Acad. 19: 90. 1883.

Stems hispid or glabrate from an elongated, tuberous root; leaf-blades cordate-hastate, 2-4 cm. long, the spreading basal lobes acute and often bifid or the blades

¹ *Ipomœa comosa* nom. nov.

Batatas villosa Choisy, in DC. Prodr. 9: 337. 1845.

Ipomœa villosa Meissn. in Mart. Fl. Bras. 7: 244, 1869. Not *I. villosa* R. & P. 1799. Brazil.

3-5-lobed, pubescent above; sepals glabrous 2.5-3 cm. long, acuminate; corolla white with a pink or purplish limb.

TYPE LOCALITY: Southeastern border of Arizona, near Santa Cruz.

DISTRIBUTION: Southern Arizona and Sonora.

SPECIMENS EXAMINED: *Thurber* 966, 1857 (type—G); *C. Wright*, 1851 (G). Tanner's Canon, near Ft. Huachuca, *Lemmon* 2833, 1882 (G, N). *Wilcox* 356 & 425, 1894 (N).

39. *Ipomœa barbiger*a Sweet, Brit. Fl. Gard. 1: pl. 86. 1823.

*Pharbitis barbiger*a G. Don, Gen. Syst. 4: 262. 1838.

Ipomœa hederacea var. *integrifolia* Hallier f. in Jahrb. Hamb. Wiss. Anstalt. 16: 42. 1898.

Convolvulus caeruleus minor, *folio subrotundo*, Dill. Hort. Elth. 97. and therefore *C. hederaceus* β , L. Sp. Pl. 154. 1753. and *Ipomœa purpurea* β , Roem. & Schult. Syst. 4: 232. 1819.

Leaf-blades orbicular-ovate, entire or deeply 3-lobed, thick-textured, ciliate, densely appressed hirsute with silky hairs above; sepals densely hirsute, 15-25 mm. long with spreading, ciliolate tips; corolla 3-3.5 cm. long, deep-blue with purple rays and a white tube.

TYPE LOCALITY: Mississippi (Dill.).

DISTRIBUTION: Sandy fields and thickets, Georgia and Florida to Alabama and Mississippi and Louisiana.

ILLUSTRATIONS: Dill. Hort. Elth. pl. 82. f. 94. Sweet, l. c.

SPECIMENS EXAMINED: Georgia; *Cuthbert*, 1900. *Pollard & Maxon* 438, 1900 (N). Florida; *Eustis*, *Nash* 2482, 1895 (Y). Jacksonville, *Curtiss* 6529, 1899 (N, Y). Tallahassee, *Berg* (Y). Mississippi; *Schuebert*, 1896 (Y). Louisiana; Vicinity of Alexandria, *C. R. Ball* 597, 1899 (N, Y, G).

40. *Ipomœa hederacea* (L.) Jacq. Collect. 1: 124. 1786.—Britton, l. c. 752.

Convolvulus calycibus tuberculatis pilosis, L. Virid. Cliff. 18.—Hort. Ups. 38.—Gronov. Virg. 141.—Roy. Lugdb. 428.

Convolvulus Virginianus elegans, *incanis foliis tripartito divisis, flore amœna purpureo*, Pluk. Phytogr. 3: pl. 451. f. 7. 1692.

Convolvulus caeruleus, *hederaceo folio, magis anguloso*, Dill. Hort. Elth. 1: 96. 1732.

Convolvulus hederaceus η L. Sp. Pl. 154. 1753. Spreng. Syst. 1: 593. 1825.

Convolvulus Nil L. Sp. Pl. ed. 2, 219. 1762 (in part as to the above Dillenian citation),—Michx. Fl. Bor.-Am. 1: 189. 1803.

Convolvulus hederæfolius Salisb. Prodr. 123. 1796.

Ipomœa scabra Forsk. Fl. Aegypt.-Arab. 44. 1775.

Ipomœa barbata Roth. Catal. 1: 37. 1797.

Ipomœa nil Pers. Syn. 1: 184. 1805.—Pursh, Fl. Am. Sept. 1: 146. 1814. Not *I. nil* Roth, 1797.

Ipomœa avicularis Raf. Fl. Ludov. 47. 1817.

Ipomœa scabrida Roem. & Schult. Syst. 4: 223. 1819.

Ipomœa phymatodes Spreng. Nov. Prov. 24. 1819.

Ipomœa cœrulea Koen. in Roxb. Fl. Ind. 2: 91. 1824.

Cleimera hederacea Raf. Fl. Tellur. 4: 77. 1838.

Pharbitis hederacea Choisy in Mém. Soc. Phys. Genève. 6: 440. 1833.—In DC. Prodr. 9: 344. 1845.—Small, l. c. 964.

Pharbitis variifolia Decne. Nouv. Ann. Mus. Par. 3: 390. 1834.

Pharbitis forskalii, *barbata*, *purshii* & *scabrida* G. Don, Gen. Syst. 4: 263. 1838.

Pharbitis cœrulescens Sweet, Hort. Brit. ed. 3, 482. 1839.

TYPE LOCALITY: Virginia, Carolina (Dill.).

DISTRIBUTION: Dry or sandy soil, fields and thickets, Virginia to Kansas, Texas, Florida and tropical America. Adventive northward to Connecticut, central New York, Ontario and Illinois.

ILLUSTRATIONS: Dill. Hort. Elth. *pl.* 80. *f.* 92. Bot. Mag. *pl.* 188. Plukn. Phytogr. l. c. Bot. Reg. *pls.* 85 & 276. Britton & Brown, Illus. Fl. 3: *f.* 2950. Jacq. Ic. Rar. 1: *pl.* 36. Knorr. Thes. Hort. *pl.* 190.

41. *Ipomœa desertorum* sp. nov.

Closely related to the preceding; pale-green; stems scabrous and sparsely pilose with loosely reflexed hairs; leaf-blades 3-lobed, lobes rarely contracted below, usually triangular-lanceolate and acuminate, appressed-hirsute above, stiffly hirsute beneath and on the petioles; peduncles 1-few flowered; bracts filiform, 4-6 mm. long; sepals linear-lanceolate, 18-26 mm. long, tips scarcely spreading, margin ciliate and base not conspicuously broadened, sparingly barbate with stiff, whitish hairs arising from conspicuously white prominent papillæ; corolla 3 cm. long, blue with a white tube; seeds finely rough-pubescent.

ARIZONA: Tuscon, *Thornber 29*, 1903 (type—Y). NEW MEXICO: Florida Mts., *Mulford 1088*, 1895 (Y). SONORA: Guaymas, *Palmer 295*, 1887 (N, Y, G). St. Magdalena, *Schott*, 1851 (C). Canon de los Guerryos, *C. E. Lloyd* (Lumholtz Exped.) 432, 1894 (G). CHIHUAHUA: South-western part, *Palmer 105*, 1885 (N, G).

42. *Ipomœa nil* (L. in part) Roth, Catal. Bot. 1: 36. 1797.—Hallier *f.* in Jahrb. Hamb. Wissensch. Anst. 15: 44. 1898; 16: 42. 1898.—Bull. Soc. Roy. Bot. Belg. 37: 94. 1898.

Convolvulus cœruleus major, *folio hederaceo*, Dill. Hort. Elth. 97.

C. annuus, *folio cordatis rarius trilobis*, *calycibus tuberculato pilosis*, L. Hort. Cliff.

- Convolvulus hederaceus* L. Sp. Pl. ed. 2, 219. 1762, in part as to f. 93 of Dillenius.
Convolvulus nil L. Sp. Pl. ed. 2, 219. 1762 (in part).
C. dillenii Desr. in Lam. Encyc. 3: 544. 1789.
Convolvuloides triloba Moench, Meth. 451. 1794.
Ipomœa cuspidata Ruiz. & Pav. Fl. Peruv. 2: II. 1799.
Ipomœa dillenii Roem. & Schult. l. c. 227.
Convolvulus peruvianus Spreng. Syst. 1: 593. 1825.
Pharbitis nil Choisy in Mém. Soc. Phys. Genève. 6: 440. 1833.— In DC. Prodr. 9: 342. 1845.
P. cuspidata G. Don, Gen. Syst. 4: 270. 1838. Choisy, l. c.
P. speciosa Choisy in DC. Prodr. 9: 343. 1845.
P. nil var. *limbata* Hook. f. Bot. Mag. pl. 5720.
I. trichocalyx Steud. Nom. Ed. 2, 1: 819. 1841.
I. longicuspis Meissn. in Mart. Fl. Bras. 7: 227. 1869.
I. hederacea Baker & Rendle, in T. Dyer, Fl. Trop. Afr. 4²: 159. 1905.

Usually larger than *I. hederacea*; lobes of the leaf-blades rarely contracted below, middle lobe usually dilated at the base; sepals linear-lanceolate, not dilated at base, 20–30 mm. long, 3–4 mm. broad, densely hispid; corolla 4.5–6 cm. long.

TYPE LOCALITY: Africa.

DISTRIBUTION: Circumtropical. In America; Florida, Bermudas, West Indies, Mexico and Central America to Paraguay and Peru.

ILLUSTRATIONS: Dill. Elth. pl. 81 f. 93. Bot. Mag. pl. 5720. Bentley & Trin. Med. pl. 185. Ruiz. & Pav. Fl. Peruv. 2: pl. 119 f. a.

SPECIMENS EXAMINED: Florida; Marco, *Hitchcock* 227, 1900. Jacksonville, *Curtiss* 5281, 1894; 5800, 1896. Jamaica; *Harris* 9155, 1906 (Y). St. Thomas; *Eggers*, 1887 (Y). St. Croix; *Ricksecker* 187, 1896 (Y). Martinique; *Duss* 431 & 1231, 1884 (Y). Guadeloupe; *Duss* 2475, 1893 (Y). Guatemala; *J. Donnell Smith* (legit *Heyde & Lux.*) 4732, 1889 (G). Nicaragua; *Chas. L. Smith*, 1893 (G). Costa Rica; *J. Donnell Smith* (legit *Tonduz* 9864) 7090, 1896 (G). Nicoya, *Tonduz* 13678, 1900 (Y).

43. *Ipomœa vahliana* nom. nov.

Convolvulus acuminatus Vahl, Symb. Bot. 3: 26. 1794.

Ipomœa acuminata Roem. & Schult. Syst. 4: 228. 1819. Meissn. l. c. 226.— Griseb. l. c. 473. Not *I. acuminata* Ruiz. & Pav. 1799.

Ipomœa punctata Macf. in Hook. Bot. Misc. 2: 116. 1831. Not *I. punctata* Pers. 1805.

Ipomœa nil Gardn. in Hook. Journ. Bot. 1: 180. 1842. Not *I. nil* Roth, 1797.

Pharbitis acuminata Choisy in DC. Prodr. 9: 348. 1845.

Leaf-blades ovate, entire or 3-lobed, lobes rarely contracted below; sepals elongated, linear-lanceolate, 15–30 mm. long, sparingly pilose, tips appressed to the corolla-tube; corolla 5.5–7 cm. long.

TYPE LOCALITY: St. Croix.

DISTRIBUTION: Thickets near the coast, West Indies and the gulf region of Mexico, Central America to Brazil.

ILLUSTRATIONS: Bot. Reg. *pl.* 39. Meissn.; Mart. Fl. Bras. 7: *pl.* 78.

SPECIMENS EXAMINED: Cuba; *C. Wright* 1647, 1859 (G).

44. *Ipomœa learii* Paxton, Bot. Mag. 6: 267. 1839.

Pharbitis learii Hook. Bot. Mag. *pl.* 3928, 1841.—Lindl. Bot. Reg. *pl.* 56. 1841.—Choisy in DC. Prodr. 9: 343. 1845.—Fletcher in Bailey's Cyclop. Am. Hort. 819. 1900.

Closely resembling *I. vahliana*, and perhaps identical; stems finely pubescent and tomentulose; leaf-blades glabrous above, finely pubescent beneath with pale hairs; peduncles capitate 3- to 9-flowered; bracts linear, 12–20 mm. long; sepals linear-lanceolate, 18–22 mm. long, minutely pubescent with appressed silvery hairs; corolla 5–6 cm. long, blue, turning rosy in age, the tube white below.

TYPE LOCALITY: Said to come from Ceylon by Paxton, but Lindley (l.c.) says that to be a mistake. The species is common in cultivation, and only the following herbarium specimens can be referred here.

Guatemala; *C. C. Deam* 316, 1905 (G). Costa Rica: *Pittier* 16277, 1902 (G).

45. *Ipomœa cathartica* Poir. Encyc. Suppl. 4: 633. 1816.—Griseb. Fl. Br. W. Ind. 473. 1861.

Convolvulus africanus Nicolson, Hist. Nat. St. Dom. 260. 1776.

Convolvulus pudibundus Lindl. Bot. Reg. *pl.* 999. 1826.

Ipomœa pudibunda G. Don, Gen. Syst. 4: 276. 1838.

Pharbitis cathartica Choisy in DC. Prodr. 9: 342. 1845.

Ipomœa fastigiata Chapm. Fl. Southern States 344. 1860. Not *I. fastigiata* Sweet.

Glabrous or nearly so; leaf-blades entire to deeply 3-lobed; sepals glabrous or nearly so, lanceolate, attenuate, 15–20 mm. long, appressed to the corolla-tube, 5- to 7-nerved at the base; corolla sometimes white.

TYPE LOCALITY: St. Domingo.

DISTRIBUTION: Thickets in sandy or calcareous soil, peninsular Florida, Bermudas, Bahamas and West Indies, gulf region of Mexico, Central and tropical South America.

7. *Cissoïdes*.

One species: Corolla small, white.

46. *I. cissoïdes*.

46. *Ipomœa cissoides* (Lam.) Griseb. Fl. Br. W. Ind. 473. 1861.¹

Convolvulus cissoides Lam. Tabl. Encyc. 1: 462. 1791.— Vahl, Eclog. Am. 2: 15. 1798.

Convolvulus calycinus H. B. K. Nov. Gen. & Sp. 3: 109. 1819.

Convolvulus orinocensis Willd.; Roem. & Schult. Syst. 4: 303. 1819.

Batatas cissoides Choisy in Mém. Soc. Phys. Genève. 6: 437. 1833.— in DC. Prodr. 9: 339. 1845.

Merremia cissoides Hallier f. Bot. Jahrb. 16: 552. 1893.

Rough-pubescent and hirsute; leaflets 5, sessile or stalked, lanceolate, or ovate-lanceolate, acute at the base, obtuse or acute at the apex, repand-dentate, 2–5 cm. long; outer sepals ovate at the base, 8–15 mm. long; corolla white, 3 cm. long or less.

TYPE LOCALITY: Cayenne.

DISTRIBUTION: Cuba and southern Mexico to Colombia and Brazil.

SPECIMENS EXAMINED: Cuba; *Wright* 3084 (G); *Curtiss* 378, 1904 (G, Y); *Wilson* 1224 & 3639, 1904 (Y); Mexico: Acapulco, *Palmer* 143, 1895 (Y, N). Guatemala; *Heyde & Lux*. 4355, 1892 (Y).

Ipomœa cissoides guadaloupensis (Steud.).

Convolvulus pilosus Wikstr. in Vet. Acad. Handl. Stock. 1827: 60. 1828.

Convolvulus guadaloupensis Steud. Nom. Ed. 2, 409, 1841.

Batatas cissoides ver. *integrifolia* Choisy in DC. Prodr. 9: 339. 1845.

Leaflets usually larger, entire, acuminate, less pubescent but the stem strongly pilose; corolla larger.

SPECIMENS EXAMINED: Cuba; *Combs* 680, 1896 (Y–G, in part).

8. **Tyrianthinæ.** Twinning, perennial or annual vines, usually with pubescent foliage and sepals. Ovary 2-celled, 4-seeded; seeds glabrous.

Leaf-blades cordate-hastate, the basal lobes rounded, laterally acute.

Sepals 12–18 mm. long or less.

Sepals 2 mm. wide × 10–12 mm. long, with lax tips; corolla 2–3 cm. long.

47. *I. iostemma*.

Sepals 3–5 mm. wide × 14–18 mm. long; corolla 5–6 cm. long.

48. *I. variabilis*.

Sepals 20–30 mm. long; corolla 2–3 cm. long.

49. *I. portoricensis*.

Leaf-blades not hastate at the base.

Corolla 2–3 cm. long; sepals hispid; lobes of the leaf-blades lanceolate.

50. *I. barbatisepala*.

Corolla 5–8 cm. long; sepals pubescent or tentacular.

Sepals densely tentacular, 18–20 mm. long.

51. *I. silvicola*.

¹ B. D. Jackson, Journ. Bot. 30: 547. 1892, on the dates of Grisebach's Flora.

Sepals not tentacular.

Corolla glabrous, tube 1–1.5 cm. thick.

Sepals acute or subobtusely; plant more or less densely pubescent.

52. *I. longipedunculata*.

Sepals long-acuminate, plant sparingly pubescent.

53. *I. orizabensis*.

Corolla pubescent without, the tube 1.5–2.5 cm. thick.

Sepals about 12 mm. long; leaf-blades strigose-pubescent beneath.

54. *I. tyrianthina*.

Sepals 22–30 mm. long; leaf-blades silvery-pubescent beneath.

55. *I. venusta*.

47. *Ipomœa iostemma* sp. nov.

Slender, annual, twining, herbaceous, 1–2 m. long or less; stems very slender, sparingly hirsute; leaf-blades ovate and entire to hastate-ovate or 3-lobed, cordate, acuminate, 2–5 cm. long, 1.5–4 cm. wide, pubescent with scattered, inconspicuous hispidulous hairs, lateral lobes acute and short, middle lobe elongated; petioles shorter than the blades; peduncles shorter than the petioles and stouter, usually 1-flowered; bracts linear, 8–10 mm. long; sepals linear, 10–12 mm. long and 1–2 mm. broad at the base, the lax tips caudate-acuminate, glabrous; corolla 2–3 cm. long, the violet-purple limb shading into white below.

COSTA RICA: Nicoya, *Tonduz 13680*, Jan. 1900 (type — Y). MEXICO: Ixtapa, Jalisco, *E. W. Nelson 4141*, 1897 (N).

48. *Ipomœa variabilis* (Schlecht. & Cham.) Choisy in DC. Prodr. 9: 383. 1845.

Convolvulus variabilis Schlecht. & Cham. in *Linnaea* 5: 116. 1830.—Hallier f. Bull. Herb. Boiss. 7: 411. 1899.

A twining annual, glabrous except for the calyx; leaf-blades ovate-lanceolate, acute or acuminate, 5–8 cm. long, entire or usually cordate-hastate, the basal lobes laterally acute; peduncles shorter than the petioles, hirsute at the base, 1–2 cm. long, 3- to 5-flowered; bracts linear-lanceolate; sepals broadly lanceolate or ovate-lanceolate, 12–15 cm. long, hirsute with spreading hairs at the base, glabrous above; corolla blue (or purple), 5–6 cm. long, the limb as broad with 5, rounded lobes; tube white, plicæ purple or rose; capsules 8–10 mm. thick; seeds smooth.

TYPE LOCALITY: Vera Cruz.

DISTRIBUTION: Mexico.

SPECIMENS EXAMINED: Vera Cruz, *Müller 119*, 1853 (C, Y). (Hallier, l. c. cites *Seler 2532, 3410*, from Guatemala.)

49. *Ipomœa portoricensis* (Spreng.) G. Don, Gen. Syst. 4: 278. 1838.

Convolvulus portoricensis Spreng. Syst. 1: 595. 1825.

?*Convolvulus meyeri* Spreng. l. c. 597.

Ipomœa meyeri G. Don, Gen. Syst. 4: 275. 1838.—Hallier f. Jahrb. Hamb. Wiss. Anstalt. 16: 43. 1898.

Ipomœa brachypoda Benth. Bot. Voy. Sulphur 135. 1844.

Ipomœa decurtata Hallier f. Bot. Jahrb. 16: 495. 1893.

Similar in habit and leaf-blades to the two preceding; peduncles 1–3 cm. long, 2- to 10-flowered; sepals linear-lanceolate, 2–3 cm. long, 4–6 mm. broad, hirsute, attenuate; corolla 2.5–3 cm. long, blue; capsules 1 cm. thick.

TYPE LOCALITY: Porto Rico.

DISTRIBUTION: West Indies, southern Mexico to Panama and Guiana.

SPECIMENS EXAMINED: Cuba; *Wright* 451, 1856–7 (G). Jamaica; *Marsh* (G); *Harris* 6931, 1897 (Y). Porto Rico; *Sintenis* 828, 1885 (Y); *Heller* 6225, 1902 (Y). Panama; *Cowell* 49 & 291, 1905 (Y). Santa Marta, Colombia, *Herbert H. Smith* 1573 & 1574, 1899 (Y).

50. *Ipomœa barbatisepala* A. Gray, Syn. Fl. N. Am. 2¹: 212. 1878.

TYPE LOCALITY: Declivity of mountain near El Paso, Texas.

DISTRIBUTION: Dry or rocky hillsides, western Texas to Arizona and Oaxaca.

SPECIMENS EXAMINED: Texas; *C. Wright* 507, 1849 (type—G); *Pringle* 68, 1884 (G). Arizona; *Lemmon* 444, 1881 (G); *Griffiths* 2032, 1900 (N); *Thornber* 76, 1903 (Y). Oaxaca; *Conzatti & Gonzalez* 697½, 1897; 1094, 1900 (G—cf. Greenm. Proc. Am. Acad. 39: 84. 1903).

51. *Ipomœa silvicola* House, Bot. Gaz. 43: 411. f. 4. 1907.

More or less densely pubescent; leaf-blades ovate, entire or 3-lobed, appressed sericeous-pubescent above, more densely so beneath; peduncles 1- to 3-flowered; sepals unequal, lanceolate, acuminate, 18–28 mm. long, appressed-pubescent and densely tentacular below; corolla 6–7 cm. long, glabrous.

TYPE LOCALITY: Rio de Las Canas, Guatemala.

DISTRIBUTION: Forests of southern Mexico to Panama.

SPECIMENS EXAMINED: Mexico: Chiapas, *E. W. Nelson* 3253 & 3419, 1895 (N). Guatemala; *John Donnell Smith* (legit Heyde & Lur.) 4022, 1892 (type—N, C). Panama; *Sutton Hayes*, July 1860 (G).

52. *Ipomœa longipedunculata* (Mart. & Gal.) Hemsley, Biol. Cent.-Am. Bot. 2: 389. 1882.

Pharbitis longipedunculata Mart. & Gal. in Bull. Acad. Brux. XII. 2: 271. 1845.

Stems reflexed hispid to nearly glabrate; leaf-blades orbicular-ovate, 6-10 cm. long, acute or acuminate, entire or rarely 3-lobed, deeply cordate, densely pubescent above and ciliate; peduncles usually elongated, 8-20 cm. long, hirsute, 1- to 5-flowered; pedicels 1-4 cm. long; sepals subequal, oblong-lanceolate, the outer ones usually obtuse, the inner acute, 12-15 mm. long, hirsute, the inner ones with scarious margins; corolla rose-purple, 6-8 cm. long, glabrous.

TYPE LOCALITY: "Crescit in Mexico, in Sylvis El Sabino prope Ixmiquilpan."

DISTRIBUTION: Thickets and forests, San Luis Potosi to Guatemala.

SPECIMENS EXAMINED: San Luis Potosi, *Palmer 45*, 1902 (N, Y, G). Vera Cruz: Orizaba, *Müller 242 & 1567*, 1855 (C); *Seaton 256*, 1891 (C, G); *Pringle 7053*, 1895 (G). Morelos; *Purpus 1755*, 1905 (Y, G). *Rose & Hay 5665*, 1901 (N, G). Mexico; *Borgeau 498*, 1856 (G), 1738, 1866 (Y). *Pringle 6452*, 1896 (G, N, C), *Urbina*, 1881 (M); *Altamirano*, 1888 (M). Oaxaca; *E. W. Nelson 1184*, 1894 (N); *Conzatti & Gonzalez 143 & 473*, 1895 (G); *Pringle 5665*, 1894 (G), 8432, 1900 (G, Y, N). Jalisco; *Palmer 335*, 1886 (N, C, G), *Pringle 4448*, 1893 (G, N, C).

Guatemala; San Miguel Uspantam, Quiche, *John Donnell Smith* (legit *Heyde & Lux.*) 3189, 1892 (G).

53. *Ipomœa orizabensis* (Pelletan) Ledenois; Steud. Nom. ed. 2, 818. 1841.

Ipomœa batatoides Benth. Pl. Hartw. 46. 1840. Not *I. batatoides* Choisy, 1837.

Convolvulus orizabensis Pelletan, in Jour. de Chemie Médicale, de Pharmacie et de Toxicologie 10: 1. 1834.

Ipomœa mestillanica Choisy in DC. Prodr. 9: 389. 1845.

Root tuberous; stems glabrous or finely pubescent; leaf-blades ovate, shallowly cordate, 3-lobed or entire, 7-10 cm. long, acuminate, lateral lobes not spreading; peduncles 1- to 5-flowered; sepals lanceolate, thin, smooth, subequal, acuminate, 10-15 mm. long; corolla 7-8 cm. long, the purplish-blue limb shading into white below.

TYPE LOCALITY: Near Orizaba, Mexico.

DISTRIBUTION: Dry or stony places, northern Mexico to Oaxaca.

ILLUSTRATIONS: Bot. Reg. pl. 36.

SPECIMENS EXAMINED: Nuevo Leon; near Monterey, *Pringle 8737*, 1903 (G, N, Y). Oaxaca; Cerro de San Felipe, *Conzatti & Gonzalez 447*, 1897 (G). Valley of Oaxaca, *E. W. Nelson 1159*, 1894 (N, G).

54. *Ipomœa tyrianthina* Lindl. Bot. Reg. Misc. 87. 1832.—Choisy in DC. Prodr. 9: 375. 1845.

?*Convolvulus serotinus* DC. Cat. Hort. Monsp. 97. 1813.

?*Ipomœa serotina* Roem. & Schult. Syst. 4: 215. 1819.

Convolvulus sanguineus Willd.; Roem. & Schult. l. c. 302.

Convolvulus superbus H. B. K. Nov. Gen. & Sp. 3: 103. 1819.

Ipomœa superba G. Don, Gen. Syst. 4: 275. 1838. Not *I. superba* Ledeb. 1822, or Schrank, 1828.

Pharbitis tyrianthina Hook. Bot. Mag. 69: pl. 4024. 1843.

Pharbitis serotina Choisy in DC. Prodr. 9: 341. 1845.

Resembling *I. longipedunculata*, but usually more hipid-pubescent; sepals oblong, hispid, acutish, subequal, 12–15 mm. long; corolla campanulate-funnelform, 6–7 cm. long, the tube 2–3 cm. thick, pubescent without.

TYPE LOCALITY: Between Aguasarco and Volcan Jorullo, Michoacan, Mexico (H. B. K.).

DISTRIBUTION: Mountain Forests, southern Mexico.

SPECIMENS EXAMINED: Guerrero; Near Chilpancingo, 9000–10200 ft. alt. *E. W. Nelson 2161*, 1894 (G, N).

55. *Ipomœa venusta* (Mart. & Gal.) Hemsley, Biol. Cent.-Am. Bot. 2: 385. 1882.

Calonyction venustum Mart. & Gal. in Bull. Acad. Brux. XII. 2: 269. 1845.—Walp. Rep. 6: 531. 1846–47.

Stout, perennial, woody below; stems velvety pubescent and tomentose; leaf-blades orbicular-ovate, 10–20 cm. long, shallowly cordate, acute, entire or slightly 3-lobed, appressed-pubescent above, silvery-canescant beneath; sepals oblong-lanceolate, acute or obtuse, 22–30 mm. long, silky-tomentose without; corolla campanulate-funnelform, 8–9 cm. long, the tube about 2 cm. thick, hirsute without on the plicæ and tube.

TYPE LOCALITY: Province of Tobasco, Mexico.

DISTRIBUTION: Southern Mexico and Central America.

SPECIMENS EXAMINED: Puebla; Huatusco, *Conzatti 850*, 1898 (G). Guatemala: Chiapas, Santa Rosa, *J. Donnell Smith* (legit *Heyde & Lux 4350*, 1892 (G, C).

SECTION III. BATATAS.

9. *Erpipomœa*. Creeping or prostrate, annual or perennial vines; roots sometimes tuberous, or stems rooting at the nodes; leaf-blades entire or lobed.

Stems rooting at the nodes.

Leaf-blades entire or toothed.

Leaf-blades broadly sagittate, the basal auricles blunt or toothed.

56. *I. reptans*.

Leaf-blades not sagittate or hastate.

Leaf-blades broadly ovate, cordate, acute.

57. *I. asarifolia*.

Leaf-blades suborbicular, obcordate or emarginate at the apex, not cordate.

58. *I. pes-capræ*.

Leaf-blades variously lobed or oblong-lanceolate, not cordate; corolla cream-colored.

59. *I. stolonijera*.

Stems prostrate, but not rooting at the nodes.

Corolla white or purple only at the base.

Leaf-blades 3- to 9-toothed.

60. *I. schaffneri*.

Leaf-blades not toothed, entire and strongly reticulate-veined beneath.

61. *I. hartwegii*.

Corolla blue or purple or only the tube white.

Peduncles usually exceeding the leaves; blades triangular-ovate and hastate, sinuately toothed at the base, pubescent.

62. *I. ignava*.

Peduncles very short; leaf-blades deltoid-reniform to triangular-ovate, angled or toothed, nearly or quite glabrous.

63. *I. eximia*.

56. *Ipomœa reptans* (L.) Poir. Encyc. Suppl. 3: 460. 1813.—Choisy in DC. Prodr. 9: 349. 1845.

Olus-vagum, Rumph. Amb. 5: 419. pl. 155. f. I.

Ballel, Rheed. Mal. 11: 107. pl. 52.

Convolvulus reptans L. Sp. Pl. 158. 1753.

Convolvulus repens Desr. in Lam. Encyc. 3: 547. 1789.—Vahl, Symb. Bot. 1: 17. 1790.—Willd. Sp. Pl. 1: 874. 1798 (excl. syn. L. and Gronov.)—Roxb. Fl. Ind. 2: 68. 1824. Not *C. repens* L. 1753.

Convolvulus adansonii Desr. l. c. 560.

Ipomœa aquatica Forsk. Fl. Aegypt.-Arab. 44. 1775.—Lam. Illus. 1: 467. 1791.—Encyc. 6: 18. 1804.

Ipomœa repens Roth; Roem. & Schult. Syst. 4: 244. 1819.—Roth, Nov. Pl. Sp. 110. 1821.

Ipomœa clappertoni R. Br. in Denh. & Clapp. Trav. Append. 240. 1826.

Ipomœa subdentata Miq. Fl. Ind. Bat. 2: 614. 1856.

Fleshy and glabrous; leaf-blades ovate-lanceolate or triangular, sagittate or subhastate, 3-8 cm. long, basal auricles obtuse, acute or toothed; corolla white tinged with magenta below, about 4 cm. long.

TYPE LOCALITY: India.

DISTRIBUTION: Wet shores, circumtropical.

ILLUSTRATIONS: Naves; Blanco, Fl. Fillip. pl. 149.

SPECIMENS EXAMINED: Cuba; *Combs 656*, 1895 (Y); *Curtiss 685*, 1905 (Y); *Britton, Britton & Shafer 505*, 1903 (Y). Guadeloupe; *Duss 3502*, 1894-95 (Y).

57. *Ipomœa asarifolia* (Desr.) Roem. & Schult. Syst. 4: 251. 1819.

Convolvulus asarifolius Desr. in Lam. Encyc. 3: 562. 1789.

Ipomœa beladambæ Roem. & Schult. Syst. 4: 233. 1819.

Convolvulus flagelliformis Roxb. Fl. Ind. 2: 68. 1824.

Amphione asarifolia Raf. Fl. Tellur. 4: 79. 1838.

Ipomœa flagelliformis Steud. Nom. Ed. 2, 816. 1841.

Ipomœa urbana Choisy in DC. Prodr. 9: 349. 1845.

Ipomœa latifolia Mart. & Gal. in Bull. Acad. Brux. XII. 2: 266. 1845.

Ipomœa nymphaefolia Griseb. Cat. Pl. Cub. 203. 1866. Not *I. nymphaefolia* Blume, 1826.

Ipomœa grisebachii Prain, Journ. As. Soc. Beng. 63: 107. 1894.

Ipomœa vogelii Baker in Kew Bull. 71. 1894.

Ipomœa repens Baker & Rendle in Dyer, Fl. Trop. Afr. 4²: 172. 1905. (excl. syn.)

Not *I. repens* Roth, 1819.

Leaf-blades orbicular-ovate, 10 cm. broad or broader, cordate, acute, entire; peduncles 1- to 5-flowered; sepals unequal, 8-10 mm. long, obtuse, corolla 6-8 cm. long, purple.

TYPE LOCALITY: Senegal, Africa.

DISTRIBUTION: Sandy fields and shores, tropical Africa, Asia, West Indies and gulf coast of Mexico.

ILLUSTRATIONS: Wight, Il. *pl. 887*.

SPECIMENS EXAMINED: Cuba; *Wright 3089* (C), *Shafer 527*, 1903 (Y); *Britton & Wilson 359*, 1903 (Y); *Wilson 1167*, 1904 (Y). Isle of Pines, *Curtiss 219*, 1903-04 (Y). Jamaica; *Harris 9826*, 1907 (Y). Mexico: Chiapas, *Caec. & Ed. Seler 1802*, 1896 (G).

58. *Ipomœa pes-capræ* (L.) Roth, Nov. Sp. Pl. 109. 1821.

Convolvulus marinus seu Soldanella, Piso & Marcgraf. Hist. Nat. Braz. 1: 51. 1648.

C. foliis subrotundis apice emarginatis basi integris, Roy. Lugdb. 428.

C. maritimus zeylandicus, folio crasso cordiformi, Herm. Lugdb. 174.

Schoranna Adamboe, Rheed. Mal. 11: 117.

C. marinus catharticus, folio rotundo, flore purpureo, Plum. Am. 89.

Convolvulus pes-capræ L. Sp. Pl. 159. 1753.

Convolvulus brasiliensis L. l. c.

Ipomœa biloba Forsk. Fl. Aegypt.-Arab. 44. 1775.

Convolvulus maritimus Desr. in Lam. Encyc. 3: 550. 1789.

- Convolvulus bauhiniaefolius* Salisb. Prodr. 125. 1796.
Ipomœa crassifolia Pers. Syn. 1: 184. 1805.
Ipomœa maritima R. Br. Prodr. 486. 1810.
Convolvulus capripes Stokes, Bot. Mat. Med. 1: 327. 1812.
Ipomœa orbicularis Ell. Bot. S. C. & Ga. 1: 257. 1817.
Ipomœa brasiliensis G. F. W. Mey. Prim. Fl. Esseq. 97. 1818.
Convolvulus bilobatus Roxb. Fl. Ind. 2: 73. 1824.
Convolvulus retusus Colla, App. Hort. Ripul. 3: 31. 1825.
Convolvulus rotundifolius Schum. & Thonn. Beskr. Guin. Pl. 102. 1827.
Ipomœa rotundifolia G. Don, Gen. Syst. 4: 265. 1838.
Plesiagopus savona Raf. Fl. Tellur. 4: 265. 1838.
Bonanox orbiculata Raf. l. c. 77.
Latrienda brasiliensis Raf. l. c. 81.
Ipomœa bilobata G. Don; Sweet. Hort. Brit. ed. 3, 483. 1839.
Ipomœa halophila Poepp.; Steud. Nom. ed. 2, 1: 817. 1841.
Ipomœa ægopoda St. Lag, in Ann. Soc. Bot. Lyon 7: 70. 1880.
Quamoclit pes-capræ Maza, Fl. Habana 346. 1897.

TYPE LOCALITY: India.

DISTRIBUTION: Sandy beaches and shores, circumtropical. In America, from Georgia and Florida to Paraguay and throughout the West Indies.

ILLUSTRATIONS: Herm. Lugdb. pl. 175. Plum. Am. pl. 104. Rheed. Mal. 11: pl. 57. Rumph. Amb. 5: pl. 159. f. 1. Bot. Reg. pl. 319. Vell. Fl. Flum. 2: pl. 62. Naves in Blanco, Fl. Fillip. ed. 3, pl. 29.

59. *Ipomœa stolonifera* (Cyrill.) Poir. in Lam. Encyc. 6: 20. 1804.
 Baker & Rendle in Dyer, Fl. Trop. Afr. 4²: 171. 1905.

Convolvulus albus, folio lacinato, maritimus, Plum. Cat. 1. 1703.

Convolvulus foliis obtusis, palmato-lobatis, etc. Plum. Am. 79.

- Convolvulus littoralis* L. Syst. ed. 10, 924. 1759.
Convolvulus stoloniferous Cyrill, Pl. Rar. fasc. 1: 14. 1788.
Convolvulus dianthus J. F. Gmel. Syst. 343. 1791.
Convolvulus acetosæfolius Vahl, Eclog. Am. 1: 18. 1796.
Ipomœa carnosa R. Br. Prodr. 485. 1810.
Ipomœa acetosæfolia Roem. & Schult. Syst. 4: 247. 1819.
Convolvulus auritus Roem. & Schult. l. c. 301.
Convolvulus incurvus Schumach. & Thonn. Beskr. Guin. Pl. 99, 1827.
Ipomœa incurva G. Don, Gen. Syst. 4: 266. 1838.
Ipomœa humilis G. Don, l. c.—Choisy in DC. Prodr. 9: 390. 1845.
Convolvulus obtusilobus Michx. Fl. Bor.-Am. 1: 139. 1803.
Batatas acetosæfolia Choisy in Conv. Rar. 124. 1837.—In DC. Prodr. 9: 338. 1845.
Latrienda imperati Raf. Fl. Tellur. 4: 81. 1838.
Ipomœa Deppeana G. Don, Gen. Syst. 4: 276. 1838.
Convolvulus sinuatus Petagne; Steud. Nom. ed. 2, 1: 411. 1841.
Ipomœa littoralis Boiss. Fl. Orient. 4: 112. 1879.—Hallier f. Bot. Jahrb. 18: 144. 1894. Not *I. littoralis* Blume, 1826.

Ipomœa imparati Griseb. Cat. Pl. Cub. 203. 1866.

Batatas littoralis Choisy, in DC. Prodr. 9: 338. 1845.

Ipomœa sinuata Kuntze, Rev. Gen. Pl. 2: 442. 1891.

Batatas incurva Benth. in Hook. Niger Fl. 467. 1849.

TYPE LOCALITY: Antilles.

DISTRIBUTION: Sandy soil and shores, circumtropical. In America, from South Carolina and Florida to South America and West Indies.

ILLUSTRATIONS: Plum. Am. pl. 90. f. 2. Cyrill, Pl. Rar. fasc. 1: pl. 5. Mart. Fl. Bras. 7: pl. 94.

60. *Ipomœa schaffneri* S. Wats. in Proc. Am. Acad. 18: 123. 1882-83.

Stems puberulent; leaf-blades orbicular, deeply cordate, acute, 3-4 cm. broad, unequally and sinuately dentate near the base; sepals equal, ovate, acute, 8 mm. long, 4-5 mm. broad, pubescent.

TYPE LOCALITY: Near San Luis Potosi, Mexico.

DISTRIBUTION: Arid plains and thickets, northern Mexico.

SPECIMENS EXAMINED: *Schaffner 621*, 1876 (type—G, N).

61. *Ipomœa hartwegii* Benth. Pl. Hartw. 15. 1839.—Choisy in DC. Prodr. 9: 376. 1845.

Stems finely pubescent, herbaceous, 50-100 cm. long; leaf-blades ovate, deeply cordate, entire, acute, 2-3 cm. long; petioles about as long and 2-glanded at the apex; peduncles 4-6 cm. long, 1-2-flowered; sepals somewhat unequal, narrowly ovate, obtuse or rounded at the apex, puberulent, dark-colored with pale scarious margins, 7-9 mm. long; corolla 6-7 cm. long, white.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Stony or dry thickets, central Mexico.

SPECIMENS EXAMINED: *Hartweg 96* (dupl. type—G). Michoacan, *Dr. Nicolas Leon*, 1885 (M). Queretaro; San Juan del Rio, *Pringle 10028*, 1905 (G, Y, N). Between Hacienda Ciervo and Cadereyta, *Rose, Painter & Rose 9704*, 1905 (Y, N).

62. *Ipomœa ignava* sp. nov.

Stems trailing from a perennial, tuberous root; pubescent, slender; leaf-blades triangular-ovate or triangular-hastate, 1-6 cm. long and as broad, obtuse, sinuately toothed toward the base, basal auricles 5-15 mm. long, appressed-hirsute or glabrate above, pubescent beneath, on the petioles and at the base of the peduncles; peduncles slender, often exceeding the leaves, 1-flowered; pedicel 5-10 mm. long; sepals very unequal, oblong-lanceolate, outer ones 4-5 mm. long, obtuse and muricate, inner 5-7 mm. long and rounded; corolla slender-funnelform, 5-7 cm. long, blue, the

white tube constricted just above the calyx, limb 5-lobed, 4-6 cm. broad; capsules globose, 1 cm. or less thick, 2-celled, 4-seeded; seeds glabrous.

MEXICO: Oaxaca; Las Sedas to La Carbonera, *Conzatti & Gonzalez* 261, 1897 (type—G); La Carbonera, 7200 ft. alt, 804, 1895 (G).

63. *Ipomœa eximia* House, *Muhlenbergia* 3: 44. *pl. 2 f. d.* 1907.

Similar to the preceding species, nearly or quite glabrous; leaf-blades deltoid-reniform or triangular-ovate, 2-2.5 cm. broad, cordate, obtuse, the margin angled or toothed, sparingly hirsute above, finely so on the veins beneath and on the margin; peduncles 2 cm. long or less, 1- to 3-flowered; sepals very unequal, outer ones and the pedicels muricate, oblong-lanceolate, blunt, 5-8 mm. long; corolla very slenderly funnelform, deep rose-purple, 4-5 cm. long, the abruptly expanded limb subentire, 3.5-4 cm. broad.

TYPE LOCALITY: Orizaba, Mexico.

DISTRIBUTION: Vicinity of Orizaba.

SPECIMENS EXAMINED: Orizaba *Müller*, 1855 (type—C, N).

10. *Dactylophyllæ*. Stout, twining, perennial vines, the stems woody below; leaf-blades divided into 3 to 9, sessile or stalked leaflets; flowers solitary or usually in irregular corymbose clusters; sepals coriaceous or leathery, obtuse, rarely acute; corolla tube constricted within or just above the calyx; capsules thick-walled, ovoid, acute, usually apiculate, 2-celled, 4-seeded; the ovary supported by a prominent culpiform disk.

Coiladena Raf. *Fl. Tellur.* 4: 12. 1838.

Modesta Raf. *l. c.* 75. (in part).

Leaflets three; sepals unequal.

Corolla white; sepals 10-15 mm. long.

Corolla red; sepals 8-10 mm. long.

Leaflets five to seven.

Sepals 6-7 mm. long.

Leaflets linear to linear-lanceolate, acute at both ends.

Leaflets linear or oblinear and revolute.

Leaflets linear-lanceolate, acuminate at both ends, not revolute.

Leaflets lanceolate to ovate-lanceolate.

Leaflets oblanceolate, obtuse.

Leaflets acuminate.

Sepals 9-10 mm. long or longer.

Capsules scarcely exceeding the calyx.

Stamens exserted; sepals equal.

Stamens included; sepals unequal.

Capsules twice as long as the calyx; corolla scarlet or purple.

64. *I. ternata*.

65. *I. lineolata*.

66. *I. jawcettii*.

67. *I. dactylophylla*.

68. *I. carolina*.

69. *I. furcensis*.

70. *I. horsfalliæ*.

71. *I. rubella*.

72. *I. plumieriana*.

64. *Ipomœa ternata* Jacq. Hort. Schoenb. 1: 16. *pl.* 37. 1797.—
Choisy in DC. Prodr. 9: 361. 1845.

Convolvulus ternatus Spreng. Syst. 1: 590. 1825.

Batatas ternata G. Don, Gen. Syst. 4: 262. 1838.

Ipomœa thomsoniana Mast. in Gard. Chron. 2: 818. 1883.

Leaflets oblong-ovate or elliptical-ovate, stalked, acute or obtuse at the ends, broadest near the middle, thick and firm, becoming subchartaceous; peduncles usually 1-flowered; sepals 10–15 mm. long, ovate, rounded; corolla dull-white with cream-colored rays, 5–6 cm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Forests of Jamaica, and cultivated in other West Indian islands.

SPECIMENS EXAMINED: Jamaica; *Harris* 7410, 1898; 9005, 1905 (Y).

65. *Ipomœa lineolata* Urb. Symb. Ant. 3: 355. 1903.

Lateral nerves of the leaflets at an angle of about 60° and about 10–12 pairs, lineolate-anastomosing close to the margin; leaflets subpellucid, pale beneath, 5–6 cm. long, cuspidate-acuminate; peduncles 2–3-flowered; corolla red, the disk pink.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Forests of Jamaica.

66. *Ipomœa fawcettii* Urban, sp. nov.

Slender, several m. long, from a perennial root, glabrous; leaf-blades divided into 5–7, spatulate filiform or narrowly linear leaflets 1–3 cm. long, revolute with age, obtuse; petioles short; flowers solitary or clustered on short leafy branches; pedicels 5–12 mm. long; sepals unequal, broadly oblong, rounded or obtuse, 4–6 mm. long, the inner ones longer and thinner than the outer; corolla subsalverform 3–4.5 cm. long, tube pale green, limb pale lilac, about 1.5–2 cm. broad with rounded, obtuse lobes; capsules ovoid, longer than the calyx, 2-celled; 4-seeded; seeds with a very long coma of light-brown hairs.

JAMAICA: Road to Wareka, *Harris* 8605, 1904 (Y); 10010, Nov. 19, 1907 (type—Y).

67. *Ipomœa dactylophylla* Griseb. Cat. Pl. Cub. 203. 1866.

Slender, glabrous or minutely puberulent; leaf-blades with 5, sessile, linear-lanceolate, entire leaflets, 3–5 cm. long, acuminate, abruptly acute at the base; peduncles shorter than the petioles, 1-flowered, 8–12 mm. long, the pedicel about as long; sepals equal, oblong-lanceolate, acute, 5–7 mm. long; corolla about 4 cm. long, the crimson limb 2.5–3 cm. broad.

TYPE LOCALITY: Eastern Cuba.

DISTRIBUTION: Thickets, eastern Cuba.

SPECIMENS EXAMINED: *C. Wright* 3093 (co-type—G). Pinar del Rio, *Palmer & Riley* 332, 1900 (N).

68. *Ipomœa carolina* L. Sp. Pl. 160. 1753. Not *I. carolina* Pursh, 1814.

Convolvulus minor pentaphyllus, flore purpureo minore, Catesb. Car. 2: 9. pl. 91.

Ipomœa caroliniana Poir. Encyc. Suppl. 6: 11. 1816.

Ipomœa heptaphylla Griseb. Mem. Am. Acad. 8: 527. 1863. Not *I. heptaphylla* Rottb. & Willd. 1803.

Quamoclit heptaphylla Maza, Fl. Habanera 346. 1897.

Leaflets 5 to 7, subspatulate, substalked, 3–8 cm. long, tapering to the base, apex rounded or obtuse; peduncles shorter than the petioles, 2- to 10-flowered; sepals subequal, elliptical to ovate, rounded or obtuse, thin, 6–8 mm. long; corolla 3–4.5 cm. long, tubular-funnelform, the limb 5-lobed, 2–3 cm. broad, tube greenish below; capsules oblong.

TYPE LOCALITY: Carolina, Bahamas (L.); Cuba (Griseb.).

DISTRIBUTION: Bahamas and Cuba.

SPECIMENS EXAMINED: Cuba; "prope villam Monte Verde & Nouvelle Sophie," *C. Wright* 1371, 1859 (G, Y). Calicita, *Combs* 509, 1895 (G); Matanzas, *Britton & Wilson* 41, 1903 (Y); Cayamos, *Earle & Baker* 2459, 1904 (Y); Santiago, *Underwood & Earle* 1674, 1903 (Y); Sagua, *Britton & Wilson* 381, 1903 (Y). Bahamas: New Providence, *Britton & Brace* 180, 1904 (Y). Andros, *Northrop* 569, 1890 (Y); *Brace* 4950, 1906 (Y).

69. *Ipomœa furcyensis* Urb. Symb. Ant. 3: 351. 1902.

Leaflets 2–5 cm. long, 5–10 mm. wide, tapering to the base, the apex acuminate, membranaceous or chartaceous with age; peduncles 3–6 cm. long, 3- to 7-flowered; sepals about 10 mm. long, tinged with red, 3.5–4.5 mm. wide, the inner a little broader and longer, obtuse; corolla 5–6 cm. long, slightly constricted below the limb.

TYPE LOCALITY: Furcy mountains, Hayti.

DISTRIBUTION: Mountains of Hayti.

SPECIMENS EXAMINED: La Brande to Mt. Balance, *Nash & Taylor* 1739, 1905 (Y).

70. *Ipomœa horsfalliæ* W. Hook. in Bot. Mag. 61: pl. 3315. 1824.
— Urb. Sym. Ant. 3: 352. 1902.

Ipomœa pendula Choisy in DC. Prodr. 9: 387. 1845. Not *I. pendula* R. Br. 1810.

Convolvulus horsfalliæ D. Dietr. Syn. Pl. 1: 664. 1839.

Coiladena hyemalis Raf. Fl. Tellur. 4: 12. 1838.

A woody twiner, several m. high; leaflets 5 or 7, obovate or oblanceolate, acuminate at the base, the apex abruptly acuminate, subchartaceous; peduncles 4–12 cm. long; pedicels 15–25 mm. long; sepals rubescent, 10–12 mm. long; corolla light purple or rose, 5–6 cm. long, narrowly funnelform, the 5-lobed limb about 4 cm. broad; stamens exserted, 30–40 mm. long.

TYPE LOCALITY: Porto Rico.

DISTRIBUTION: Porto Rico, Virgin Islands, Guadeloupe and Martinique. Common in cultivation.

ILLUSTRATIONS: Bot. Mag. *pl.* 3315. Paxt. Bot. Mag. **3**: *pl.* 50. Knowl. & Westc. Fl. Cab. **1**: *pl.* 29. Maund. Bot. **1**: *pl.* 31.

SPECIMENS EXAMINED: Martinique; *Duss* 1882 & 3086, 1895 (Y).

71. *Ipomœa rubella* House, Bot. Gaz. **43**: 414. 1907.

Ipomœa pulchella W. Hook. in Bot. Mag. **73**: *pl.* 4305. 1847. Not *I. pulchella* Roth, 1821.

Ipomœa macrorrhiza Griseb. Fl. Br. W. Ind. 471. 1861.—Mast. in Gard. Chron. New Ser. **23**: 566. 1885. Not *I. macrorrhiza* R. & S. 1819.

Ipomœa grisebachii Urb. Sym. Ant. **3**: 353. 1903. Not *I. grisebachii* Prain, 1894.

Leaflets 5, or rarely 3, stalked, obovate or obovate-lanceolate, 6–12 cm. long, tapering to the base, the apex short-acuminate, subcoriaceous; peduncles many-flowered; sepals green, tinged with red on the margins and apex, oval or ovate, the inner obovate, 9–11 mm. long, obtuse; corolla pale rose-colored, 6–6.5 cm. long; capsules 10–12 mm. long.

TYPE LOCALITY: Manchester, Jamaica.

DISTRIBUTION: Forests of Jamaica.

SPECIMEN EXAMINED: Jamaica, *Marsh* (G). *Harris* 8651, 8727, 1904 (Y); *Britton* 536, 1906 (Y); *Underwood* 3410, 1906 (Y).

72. *Ipomœa plumieriana* House, Bot. Gaz. **43**: 413. 1907.

Convolvulus coccineus heptaphyllus, radice crassissima, Plum. Cat. 1. 1703.—Plum. Am. 79. (excl. syn. Sloan, Browne and Pluk.)

Convolvulus macrorrhizos L. Syst. ed. 10, 923. 1759.—Sp. Pl. ed. 2, 223. 1762.

Ipomœa macrorrhizos Roem. & Schult. Syst. **4**: 311. 1819.—Choisy in DC. Prodr.

9: 388. 1845.—Urb. Sym. Ant. **3**: 352. 1902. Not *I. macrorrhiza* Michx. 1803.

Batatas macrorrhiza G. Don, Gen. Syst. **4**: 261. 1838.

Leaflets 7- (rarely 5-, 6- or 8-) stalked, elliptical-oblong or lanceolate, 5–10 cm. long, acuminate at the base, apex abruptly acuminate, membranaceous or chartaceous; peduncles 1–6 cm. long, several flowered, sepals suborbicular, the inner longest, 9–10 mm. long; corolla scarlet or purplish, 5–6 cm. long, the tube dilated-campanulate and slightly contracted above; capsules twice as long as the calyx.

TYPE LOCALITY: America (L.); Jamaica (Plum.).

DISTRIBUTION: Forests of Jamaica, Hayti and St. Domingo.

ILLUSTRATIONS: Plum. Am. *pl.* 90. *f.* 1.

SPECIMENS EXAMINED: Jamaica; Gordontown road, *Harris*, Jan. 7, 1902 (J). Barrack Hill, *W. Cradwick*, July 1890 (J). Port Antonio, *Britton* 890, 1906. (Y).

11. *Setosæ*. Twining or climbing perennial vines; leaf-blades ovate, cordate, acute, entire or 3-lobed; flowers solitary or cymose; peduncles thickened and fleshy; sepals ovate-lanceolate or ovate, setaceous or tentacular; pedicels more or less tentacular or setaceous.

Gomphius Raf. Fl. Tellur. 4: 75. 1838.

Petioles and often the leaves, calyces and pedicels bristly with long, spreading setæ; leaf-blades 3-lobed. 73. *I. setosa*.

Petioles not setaceous.

Peduncles longer than the subtending petioles; sepals 8-9 mm. long, densely tentacular. 74. *I. tentaculifera*.

Peduncles shorter than the petioles; sepals 11-12 mm. long, acute, sparingly tentacular. 75. *I. lozani*.

73. *Ipomœa setosa* Ker. Bot. Reg. *pl.* 335. 1818.

Convolvulus setosus Spreng. Syst. 1: 594. 1825.

Gomphius setosa Raf. Fl. Tellur. 4: 75. 1838.

Batatas setosa Lindl. Bot. Reg. Index xv. 1839.

Calonyction setosum Hallier f. Bull. Herb. Boiss. 5: 1048. 1897.

The orbicular-ovate, deeply 3-lobed leaf-blades 10-20 cm. long; peduncles as long as the petioles, 3- to 9-flowered; pedicels 25-30 mm. long, thickened and fleshy, lactescent in fruit; sepals oblong, obtuse, 10-14 mm. long, accrescent in fruit, densely setaceous; corolla purplish-red, 5-6 cm. long, tube cylindrical; capsules 15-20 mm. thick, 4-celled, 4-seeded.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Tropical America. Introduced with coffee seed into the West Indies, Mexico and Gulf States.

ILLUSTRATIONS: Bot. Reg. l. c. Bull. Herb. Boiss. 5: *pl.* 17, 18.

SPECIMENS EXAMINED: Florida; Manatee, *Simpson* 111, 1890 (Y). Louisiana; Franklin, *O'Niell*, 1900 (Y).

Ipomœa setosa campanulata (Hallier f.). *comb. nov.*

Ipomœa macrantha Peter, in Engl. & Prantl. Nat. Pflanzenfam. IV. 3a: 31. 1891. Not *I. macrantha* Roem. & Schult. 1819.

Calonyction campanulatum Hallier f. in Bull. Herb. Boiss. 5: 1050. 1897.

Sepals becoming 20-22 mm. long, the setæ weak; corolla lilac, about 8 cm. long, campanulate-funnelform, the tube constricted at the base.

TYPE LOCALITY: Vera Cruz, Mexico.

DISTRIBUTION: Mexico and Central America.

SPECIMENS EXAMINED: Guatemala; San Jose, *Sutton Hayes*, 1860 (G).

***Ipomœa setosa pavoni* (Hallier f.). comb. nov.**

Ipomœa setosa Griseb. Fl. Br. W. Ind. 469. 1861.

Calonyction pavoni Hallier f. in Bull. Herb. Boiss. 5: 1048. 1897.

Similar to *I. setosa*, the stem clothed with weaker, hair-like setæ; flowers cincinnal in short, axillary dichasia, long-peduncled; pedicels clavate; the outer sepals with a few weak setæ; corolla campanulate, white or pale violet-purple, the tube conspicuously dilated above the calyx, 5-7 cm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: West Indies and tropical South America.

74. ***Ipomœa tentaculifera* Greenm. Proc. Am. Acad. 33: 482. 1898.**

Root, tuberous and perennial; leaf-blades ovate, 8-10 cm. long, entire, acuminate; peduncles 7-12 cm. long, 1-flowered; the pedicel 4-6 cm. long; sepals oblong, obtuse or rounded, the tentacular outgrowths 7-10 mm. long; corolla violet-purple, 7-8 cm. long.

TYPE LOCALITY: Tomellin Canon, Oaxaca, Mexico.

DISTRIBUTION: Oaxaca, Mexico.

SPECIMENS EXAMINED: *Pringle 6702*, 1897 (type — G, Y, N).

75. ***Ipomœa lozani* Painter; House, Bot. Gaz. 43: 411. f. 3. 1907.**

Perennial from a tuberous root; leaf-blades narrowly ovate, deeply cordate-sagittate, abruptly narrowed toward the apex, attenuate, 5-8 cm. long, the basal lobes rounded, converging and overlapping; peduncles shorter than the petioles; pedicel 3-4 cm. long; sepals puberulent, only slightly tentacular, oblong-lanceolate acute; corolla purple, 6-7 cm. long, white below.

TYPE LOCALITY: San Juan del Rio, Queretaro, Mexico.

DISTRIBUTION: Stony Hills, Queretaro and Tamaulipas.

SPECIMENS EXAMINED: *Rose, Painter & Rose 9542*, 1905 (type — N, Y); *Pringle 10029*, 1905. Tamaulipas; Between Victoria and Janmave Valley, *E. W. Nelson 4440*, 1898 (N).

12. ***Bombycospermæ*.** Stout, woody, perennial vines, with flowers in dense, axillary, suberect or pendant racemes; seeds covered on all three surfaces with long white, crinkled, wool-like hair.

Bombycospermum Presl. Reliq. Haenk. 2: 137. 1837.

One species.

76. *I. bombycina*.

76. *Ipomœa bombycina* (Choisy) Benth. & Hook. Gen. Pl. 2: 873. 1876.

Bombycospermum mexicanum Presl. Reliq. Haenk. 2: 137. pl. 71. 1837.

Batatas bombycina Choisy, in DC. Prodr. 9: 340. 1845.

Leaf-blades ovate, acuminate, rounded or obtuse at the base, 8–10 cm. long, glabrous above, pubescent beneath; flowering racemes 5–15 cm. long, many-flowered; pedicels about 1 cm. long; sepals ovate, 4–6 mm. long, obtuse, silky-pubescent; corolla about 4.5 cm. long, the tube 1.5 cm. long by 3 mm. thick, the limb campanulate, 3 cm. long and about 1 cm. thick, silky-pubescent without, purplish; capsules 1.5–2 cm. high and 7–8 mm. thick.

TYPE LOCALITY: Western Mexico.

DISTRIBUTION: Southwestern Mexico.

SPECIMENS EXAMINED: Guerrero; Tecpan, *Langlasse 939*, 1899 (N). Acapulco; *Palmer 370*, 1894–95 (N, G).

13. *Palmatæ*. Twining, annual or perennial vines, with palmately or digitately divided leaf-blades; seeds hirsute or lanata on the dorsal angles.

Modesta Raf. Fl. Tellur. 4: 75. 1838 (in part).

Segments of the leaf-blade parted nearly or quite to the petiole.

Margin of the corolla-limb crenulate.

77. *I. Cavanillesii*.

Margin of the corolla-limb not crenulate.

Peduncles stout, 1–9-flowered; sepals obtuse.

78. *I. cairica*.

Peduncles filiform, 1–2-flowered. Sepals acute, equal; corolla violet.

79. *I. pulchella*.

Sepals unequal, obtuse; corolla white.

80. *I. quinquefolia*.

Segments of the leaf-blades parted to or but slightly beyond the middle.

Corolla rose-purple; plant stout, perennial from a tuberous root.

81. *I. digitata*.

Corolla yellow, with a purple throat; plant slender, annual.

82. *I. flavo-purpurea*.

77. *Ipomœa cavanillesii* Roem. & Schult. Syst. 4: 214. 1819.—Griseb. Fl. Br. W. Ind. 470. 1861.

Ipomœa pentaphylla Cav. Ic. 3: 29. pl. 256. 1794. Not *I. pentaphylla* Jacq. 1788. *Convolvulus cavanillesii* Spreng. Syst. 4: 590. 1825.

Batatas cavanillesii G. Don, Gen. Syst. 4: 262. 1838.

Ipomœa bouvetii Duchass. & Walp. in Linnaea 23: 752. 1850.

Closely resembling *I. cairica*; sepals ovate or ovate-lanceolate, 6–7 mm. long, coriaceous, glabrous or the outer ones punctate-scabrous; corolla pale rose-colored, white below, about 5 cm. long, the ovate, rounded lobes of the limb crenulate; seeds lanate.

TYPE LOCALITY: "Colitur in R. horto Matritense, ex seminibus missis ab Hispanio."

DISTRIBUTION: West Indies and northern South America.

78. *Ipomœa cairica* (L.) Sweet, Hort. Brit. 287. 1827.

Convolvulus foliis laciniatis vel quinquefolius, Bauh. Pin. 295.

C. quinquefolius, seu *foliis laciniatis, flore purpureo cœrulea*, Bauh. Prodr. 134.

Convolvulus ægyptius Vesl. Aegypt. 73. pl. 74.

Convolvulus cairicus L. Syst. ed. 10, 922. 1759.—Sp. Pl. ed. 2, 222. 1762.

Ipomœa palmata Forsk. Fl. Aegypt.-Arab. 43. 1775.—Choisy in DC. Prodr. 9: 386. 1845.

Ipomœa senegalensis Lam. Illus. 1: 464. 1791.

Ipomœa stipulacea Jacq. Hort. Schoenb. 2: 39. 1797.

Convolvulus quinquelobus Vahl, Symb. Bot. 3: 32. 1794.—Willd. Sp. Pl. 1: 863. 1798.

Convolvulus tuberculatus Desr. in Lam. Encyc. 3: 545. 1789.

Ipomœa vesciculosa Beauv. Fl. d'Owar. 2: 73. 1807.

Ipomœa tuberculata Roem. & Schult. Syst. 4: 208. 1819.

Ipomœa quinqueloba Roem. & Schult. l. c.—G. Don, Gen. Syst. 4: 279. 1838.

Convolvulus digitatus Roxb. Fl. Ind. (ed. Carey) 1: 479. 1832.

Ipomœa digitifolia Sweet, Hort. Brit. ed. 2, 372. 1830.

Ipomœa heptaphylla Voigt. Hort. Suburb. Calc. 360. 1845.

Batatas senegalensis G. Don, Gen. Syst. 4: 261. 1838.

Stems more or less warty; leaf-segments 2-5 cm. long; sepals equal, 6-7 mm. long, ovate-lanceolate, obtuse; corolla 5-6 cm. long, the limb slightly 5-lobed; capsules 10-12 mm. high; seeds hairy.

TYPE LOCALITY: Egypt.

DISTRIBUTION: Circumtropical. Introduced into Mexico and Florida.

ILLUSTRATIONS: Sloan. Jam. 1: pl. 96. f. 2. Jacq. Hort. Schoenb. pl. 129. Bot. Reg. pl. 96, 768. Bot. Mag. pl. 699. Trans. Hort. Soc. 1: pl. 11. Mart. Fl. Bras. 7: pl. 105. Beauv. l. c. pl. 106. Sertum Bot. 2: v-CL. 1829.

SPECIMENS EXAMINED: Grenada; *W. E. Broadway*, Dec. 16, 1904 (Y). Florida; Waste ground, Pensacola, *Curtiss* 6496, 1899 (Y).

79. *Ipomœa pulchella* Roth, Nov. Pl. Sp. 115. 1821.—Choisy, Mém. Soc. Phys. Genève. 6: 473. 1833.—In DC. Prodr. 9: 386. 1845. Griseb. Fl. Br. W. Ind. 470. 1861. Not *I. pulchella* G. Don, 1838.

Convolvulus Aegyptiacus, etc. Moris. Hist. 2: 18. 1680.

Convolvulus heptaphyllus Rottl. & Willd. in Ges. Naturf. Fr. Neue Schr. 4: 196. 1803. —Roxb. Hort. Beng. 14. 1814.—Fl. Ind. 2: 66. 1824.

Convolvulus bellus Spreng. Syst. 1: 590. 1825.

Ipomæa radicans Bertol.; Choisy in DC. Prodr. 9: 389. 1845.

Ipomæa gracillima Prain, Journ. As. Soc. Beng. 63: 111. 1894.

Ipomæa spirale House, Muhlenbergia 3: 40. 1907.

Slender, glabrous or nearly so; leaf-segments linear-lanceolate, acute or acuminate at each end, 1–3 cm. long, entire or the outer ones bifid; petioles longer than the blades or shorter; peduncles filiform, as long as the petioles or longer, frequently twisted and tendril-like, used in climbing; pedicel 8–16 mm. long, stouter than the peduncle; bracts minute, about 1 mm. long; sepals equal, narrowly ovate or lanceolate, 4–5 mm. long, becoming 6–7 mm. long in fruit; capsules 10 mm. high or less; corolla pale violet, campanulate-funnelform, 18–30 mm. long.

TYPE LOCALITY: East Indies.

DISTRIBUTION: Tropics of the Old World. West Indies, Mexico to Central America, Peru and Brazil. Introduced into Louisiana.

SPECIMENS EXAMINED: Porto Rico: Guanica, *Sinten's* 3679, 1886 (G). Mexico; Yaqui River, *Palmer* 24, 1864 (N.). Louisiana: near New Orleans, *R. S. Cocks*, June 1905 (Y).

80. *Ipomæa quinquefolia* L. Sp. Pl. 162. 1753.¹

Convolvulus foliis digitatis glabris, caule laevi, Roy. Lugdb. 429.

Convolvulus quinquefolius glaber americanus, Plukn. Alm. 116, pl. 167. f. 6.

Convolvulus quinquefolius L. Syst. ed. 10, 923. 1759.—Desr. in Lam. Encyc. 3: 566. 1789.

Convolvulus palmatus Mill. Dict. No. 8, 1768.

Convolvulus hispaniolæ Spreng. Syst. 1: 590. 1825.

Convolvulus ampelopsifolius Cham. & Schlecht., in Linnaea 5: 118. 1830.

Pharbitis quinquefolia Raf. Fl. Tellur. 4: 81. 1838.

Frazima quinquefolia Raf. l. c. 83.

Latrienda palmatus Raf. l. c. 81.

Ipomæa hispaniolæ G. Don, Gen. Syst. 4: 1838.

Batatas quinquefolia Choisy, Conv. Rar. 127. 1837.—In DC. Prodr. 9: 339. 1845.

Merremia quinquefolia Hallier f. Bot. Jahrb. 16: 552. 1893.

TYPE LOCALITY: America.

DISTRIBUTION: Thickets, West Indies and Mexico to Central America, Brazil and Peru.

¹ Not closely related to the African species, *Ipomæa quinquefolia* Hotchster, which may well take the following name.

Ipomæa hochsteri nom. nov.

Ipomæa quinquefolia Hochst., Hallier f. Bot. Jahrb. 18: 147, 1894.—Native of tropical and southern Africa, cf. Baker & Rendle in Dyer, Fl. Trop. Afr. 42: 177. 1905.

81. *Ipomœa digitata* L. Syst. ed. 10, 924. 1759.

Quamoclit foliis digitatis, flore coccineo, Plum. Am. 81.

Pal-modecca Rheed. Mal. 11: 101.

Convolvulus paniculatus L. Sp. Pl. ed. 2, 223. 1762.—Willd. Sp. Pl. 1: 865. 1798.

Ipomœa mauritiana Jacq. Hort. Schoenb. 2: 39. 1797.

Ipomœa paniculata R. Br. Prodr. 486. 1810.—Hallier f. Bot. Jahrb. 18: 150. 1894.

Ipomœa enneloba Beauv. Fl. d'Owar. 2: 69. 1807.

Ipomœa tuberosa G. F. W. Mey. Prim. Fl. Esseq. 113. 1818. Not *I. tuberosa* L. 1753.

Convolvulus roseus H. B. K. Nov. Gen. & Sp. 3: 108. 1819.

Ipomœa quinqueloba Willd.; Roem. & Schult. Syst. 4: 789. 1819.

Ipomœa pentaloba Roem. & Schult. l. c. Index. 828.

Batatas paniculata Choisy in Mem. Soc. Phys. Genev. 6: 436. 1833.—In DC. Prodr. 9: 339. 1845. (excl. syn. Willd., Spreng., Andr., Bot. Reg. 75, and Bot. Mag. 1790.)

Quamoclit digitata G. Don, Gen. Syst. 4: 75. 1838.

Modesta paniculata Raf. Fl. Tellur. 4: 260. 1838.

Modesta congesta Raf. l. c.

Ipomœa baalan Montr. in Mem. Acad. Lyon 10: 238. 1860.

TYPE LOCALITY: America.

DISTRIBUTION: Forests and thickets at low altitudes, circumtropical.

ILLUSTRATIONS: Plum. Am. *pl.* 92. *f.* 1. Jacq. Hort. Schoenb. *pl.* 200. Rheed. Mal. 11: *pl.* 49. Bot. Reg. *pl.* 62. Beauv. l. c. *pl.* 101. Naves in Blanco Fl. Fillip. ed. 3, Ic. *pl.* 32. Revue Hort. 1853. p. 20. Kerner, Hort. *pl.* 65.

82. *Ipomœa flavo-purpurea* Urb. Sym. Ant. 3: 245. 1902.

Ipomœa punctata C. Wright in Sauv. Fl. Cub. 105. 1870. Not *I. punctata* Macf. 1831.

The linear-lanceolate leaf-segments minutely hispidulous and pellucid-punctate; petioles pilose; peduncles 1-flowered; sepals sparingly pilose, ovate-oblong, subulate, 6-7 mm. long, corolla about 2 cm. long; capsules 4-celled; seeds lanate and pilose on the dorsal angles.

TYPE LOCALITY: Cuba: "En las sabanas del potrero Manati y en Casilda Trinidad."

DISTRIBUTION: Cuba.

SPECIMENS EXAMINED: Cuba, *C. Wright* (without No. in Hb. Gray).

14. *Jalapæ*. Twining or trailing, mostly perennial vines with stout or woody stems below, frequently with tuberous, woody roots; sepals leathery, usually obtuse; corolla white, pink or purple, mostly slender-funnelform.

Corolla white or cream-colored or tinged with magenta below.

Leaf-blades subtruncate, plicate, glabrous; peduncles shorter than the petioles.

83. *I. plicata*.

Leaf-blades cordate, not plicate.

Sepals about 7 mm. long.

Stems and sepals setaceous-hispid.

84. *I. crinita*.

Stems and sepals glabrous.

85. *I. populina*.

Sepals 10–20 mm. long, or longer.

Foliage white-tomentulose or silvery-pubescent beneath.

Corolla densely pubescent, the white-canescens sepals 18–20 mm. long.

86. *I. præcana*.

Corolla glabrous; sepals 12–16 mm. long.

87. *I. macrorrhiza*.

Foliage glabrous or pubescent, not silvery.

Sepals aristate; capsules ovoid, apiculate.

88. *I. scopulorum*.

Sepals blunt or obtuse.

Calyx 10 mm. thick or more at flowering time; sepals oblong.

89. *I. pandurata*.

Calyx 5–6 mm. thick; sepals lanceolate; leaves minutely pubescent to velvety-pubescent in var.

90. *I. sabulosa*.

Corolla blue, pinkish or purple.

Sepals more than 10 mm. long (except no. 94).

Leaf-blades silvery-pubescent beneath or velvety-pubescent.

Corolla 7–10 cm. long; leaf-blades tomentose beneath.

Leaf-blades entire or 3-lobed.

91. *I. jalapa*.

Leaf-blades palmately 5-lobed.

92. *I. leonensis*.

Corolla 6 cm. long or less.

Leaf-blades silvery-pubescent beneath, oblong, rounded or subcordate at the base.

Sepals oval, 10–13 mm. long.

93. *I. lacteola*.

Sepals 6–8 mm. long.

94. *I. hypargyrea*.

Leaf-blades densely velvety-pubescent above and below, broadly ovate and equally 3-lobed.

95. *I. passifloroides*.

Leaf-blades glabrous or finely pubescent.

Sepals tomentulose, 12–14 mm. long; leaf-blades triangular-ovate and lobed.

96. *I. rupicola*.

Sepals glabrous or minutely pubescent.

Leaf-blades finely pubescent, oblong-ovate to oblong-lanceolate, shallowly cordate.

97. *I. nicoyana*.

Leaf-blades glabrous above.

Sepals equal; corolla rose-purple to white, 8–10 cm. long.

98. *I. calantha*.

Sepals unequal; corolla blue, 5–6 cm. long.

99. *I. cyanantha*.

Sepals less than 10 mm. long.

Sepals 6-8 mm. long; leaf-blades lobed or entire;
corolla purple; Cuban.

100. *I. obtusata*.

Sepals 4-6 mm. long; leaf-blades entire.

Corolla pink, 6-8 cm. long.

101. *I. carnea*.

Corolla purple, about 4.5 cm. long; leaf-blades
submembranaceous.

102. *I. microsticta*.

83. *Ipomœa plicata* Urb. sp. nov.

Slender, perennial, climbing over trees and bushes, 6-10 m. long, branching, woody below with a rough, whitish bark; finely pubescent above; leaf-blades ovate or ovate-lanceolate, more or less plicate, acuminate, 4-10 cm. long, glabrous above, finely pubescent beneath; petioles 1-4 cm. long; peduncles shorter than the petioles, 1- to 3-flowered; pedicels 1 cm. long; sepals yellowish-green, 10-13 mm. long, acute, puberulent; corolla 4-5 cm. long, campanulate-funnelform, fragrant; limb about 4 cm. broad, with 5, rounded lobes; capsules ovoid, apiculate, longer than the calyx, 2-celled; seeds densely lanate.

JAMAICA: Mount Diablo, 2800 ft. alt., *Harris 8997*, Aug. 29, 1905 (type—Y).

84. *Ipomœa crinita* Brandegee, *Zoe* 5: 216. 1905.

The woody stems as well as the petioles and peduncles pilose with white, spreading hairs, 4-5 mm. long; leaf-blades 3-lobed, about 14 cm. broad; peduncles elongated, 20-22 cm. long, subumbellately flowered; outer sepals pilose, 7 mm. long, apiculate.

TYPE LOCALITY: Culiacan, Mexico.

DISTRIBUTION: Ravines and thickets, western Mexico.

SPECIMENS EXAMINED: *Brandegee*, Sept. 12, 1904 (dupl. type—G).

85. *Ipomœa populina* sp. nov.

A stout, woody, perennial twining vine, climbing over trees; stems 1-2 cm. thick, with a smooth bark; leaf-blades ovate, entire, acute, shallowly cordate, 5-8 cm. long, reticulate-veined beneath; petioles slender, longer than the blades; peduncles stout, on the stems of the preceding year, 8-12 cm. long, cymosely many-flowered, the angled pedicels 2.5-3 cm. long; sepals subequal, orbicular-ovate, 5-8 mm. long, spreading in fruit; corolla tinged with magenta at the base, 6 cm. long; limb 6-8 cm. broad with 5, rounded lobes, tube 12-15 mm. thick; capsules thick-walled, oblong, 2 cm. long and 1 cm. thick, 4-valved, 2-celled; seeds twice as long as thick, with a long, white dorsal coma.

MEXICO: Acapulco, *Palmer 482*, 1894-95 (type—N, G).

86. *Ipomœa præcana* sp. nov.

Stout, woody, perennial; stems densely canescent or silvery, furrowed; leaf-blades orbicular, 8–12 cm. long, shallowly cordate, veins 5–7 pairs, densely pubescent or nearly glabrate above, silvery-pubescent beneath; petioles 3–5 cm. long; peduncles shorter than the petioles, 3- to 5-flowered; pedicels 5–10 mm. long and with the calyx strongly furrowed or wrinkled when dried; sepals 18–20 mm. long, imbricated, canescent, obtuse, glabrous within; corolla subsalverform, 6–7.5 cm. long, pubescent without, the tube constricted and glabrous at the base; limb 6–10 cm. broad.

MEXICO: Oaxaca; Reyes, 2500–4000 ft. alt. *E. W. Nelson* 1823, Oct. 20, 1894 (type — N, G). Morelos; Near Cuernavaca, on lava beds, *Pringle* 7229, 1896 (G).

87. *Ipomœa macrorhiza* Michx. Fl. Bor. Am. 1: 141. 1803.—G. Don, Gen. Syst. 4: 277. 1838.

Ipomœa jalapa Pursh, Fl. Am. Sept. 1: 146. 1814. (as to descr. excl. syn. L.).

Convolvulus macrorhizus Ell. Bot. S. C. & Ga. 1: 252. 1817.

Ipomœa mechoacan Nutt. in Am. Jour. Sci. 5: 289. 1822.

Ipomœa michauxii Sweet, Hort. Brit. 288. 1826.—Chapm. Fl. Southern U. S. 343. 1860.

Ipomœa Purshii G. Don, in Sweet; Hort. Brit. ed. 3, 484. 1839.

Perennial from a napiform or thickened fusiform root, tomentulose-pubescent; leaf-blades entire or lobed; peduncles 1–5-flowered; sepals unequal, outer ones 10–12 mm. long, inner 15–20 mm. long; corolla 7–10 cm. long, magenta at the base; capsules 4-celled.

TYPE LOCALITY: "In maritimis Georgiæ et Floridæ." (Michx.)

DISTRIBUTION: Light sandy soil, near the coast, South Carolina to Florida and northern Mexico.

ILLUSTRATIONS: Bot. Reg. pl. 342.

SPECIMENS EXAMINED: Florida; *Curtiss* 2165, 4381; *Boring*, 1899 (Y); *Cheshire*, 1881 (Y); *Chapman* (Y); *Berg* (Y); *Levenworth* (G). South Carolina; *Mellichamp* (G). Tamaulipas, Mexico, *E. W. Nelson* 4441 1898 (N).

88. *Ipomœa scopulorum* Brandegeë, Zoe 5: 169. 1903.

Pubescent throughout; leaf-blades entire, cordate, 6–7 cm. long; peduncles about as long as the leaves, 1–4-flowered; sepals ovate aristate, coriaceous, unequal, 1–2 cm. long; corolla 6–8 cm. long.

TYPE LOCALITY: Mazatlan, Lower California.

DISTRIBUTION: Rocky or dry thickets, Cape region, Lower California, and northwestern Mexico.

SPECIMENS EXAMINED: Mazatlan, *Brandegee*, (N); Culiacan, Sinaloa, *Brandegee*, Oct. 11, 1904 (G).

89. *Ipomœa pandurata* (L.) G. F. W. Mey. Prim. Fl. Esseq. 100. 1818.—Small, Fl. Southeastern U. S. 962. 1903.

Convolvulus foliis inferioribus cordatis, superioribus trilobis, etc. Gronov. Virg. 141.

Convolvulus panduratus L. Sp. Pl. 153. 1753. Ell. Bot. S. C. & Ga. 1: 254. 1817.

Convolvulus ciliolatus Michx. Fl. Bor.-Am. 1: 139. 1803.

Convolvulus candicans Soland; Sims, Bot. Mag. pl. 1603. 1813.

Ipomœa ciliosa Pursh, Fl. Am. Sept. 1: 146. 1814.

Ipomœa ciliolata Pers. Syn. 1: 183. 1805.—G. Don, Gen. Syst. 4: 270. 1838.

Ipomœa candicans G. Don, Gen. Syst. l. c. 273.

Convolvulus rubescens Choisy in DC. Prodr. 9: 338. 1845.

TYPE LOCALITY: Virginia.

DISTRIBUTION: Dry fields, southern Ontario, New York and Connecticut to Michigan, Kansas, Florida and Texas.

ILLUSTRATIONS: Dill. Elth. pl. 85, f. 99. Plukn. Amalth. pl. 385, f. 3. Bot. Mag. pl. 1603, 1939. Bot. Reg. pl. 588. Britt. & Br., Illus. Fl. 3: f. 2945.

90. *Ipomœa sabulosa* sp. nov.

Ipomœa pandurata Conzatti & Smith, Syn. Fl. Mex. 3: 48. 1895.

Resembling the preceding species; perennial from a tuberous root; foliage minutely pubescent; leaf-blades ovate, acuminate, shallowly-cordate or subtruncate, 5–8 cm. long; peduncles 1- to 3-flowered, the subulate bracts 5–8 mm. long and often not opposite when the peduncle is 1-flowered; outer sepals about 10 mm. long, acute, pubescent, inner ones 12–14 mm. long by 3–4 mm. wide, obtuse and submembranaceous; corolla 5–6 cm. long, constricted within the calyx, creamy-white with magenta base; limb 6–7 cm. broad with 5, rounded lobes.

MEXICO: Oaxaca; Jayacatlan, *Rev. L. C. Smith* 142, 1894 (type G). San Luis Potosi; Villar, *Pringle* 5473, 1893 (G).

Ipomœa sabulosa mollicella var. nov.

Leaf-blades entire or hastately lobed; softly and densely velvety-canescens; sepals 10–12 mm. long.

MEXICO: Oaxaca, Cuesta de Domingillo, 4000 ft. alt. *Albert L. Smith* 640, 1895 (type — G).

Ipomœa sabulosa hirtella var. nov.

Leaf-blades ovate to oblong-ovate, hirsute above with harsh, conspicuously whitish hairs, more densely so beneath; rarely glabrate above.

MEXICO: Chiapas, Near San Cristobal, 7000–8000 ft. alt. *E. W. Nelson* 3281, 1895 (type — 233075 — N, G).

91. *Ipomœa jalapa* (L.) Pursh; Bot. Mag. *pl.* 1572. (as synonym)
1 Au. 1813. *I. jalapa* Pursh, Fl. Bor. Am. 1: 146. 1814 (excl. descr.)

Convolvulus radice tuberosa cathartica, Houst. in Mill. Dict. No. 19. 1741.

C. foliis variis, pedunculis unifloris, radice tuberosa, Mill. Dict. No. 32. 1759.

C. americanus jalapium dictus, Ray. Hist. 724.

Byronia mechoacana nigricans, Bauh. Pin. 298. — Hist. 151.

Jalapium, mechoacanna nigra, Dal. Pharm. 201.

Convolvulus jalapa L. Mant. 43. 1759. — Mill. Dict. ed. 8, 1768.

Convolvulus mechoacan Vitm. Summa Pl. 1: 434. 1789.

Convolvulus lividus Moc.; Steud. Nom. ed. 2, 1: 409. 1841.

Convolvulus jatiauca J. F. Gmel. Syst. 339. 1796.

Batatas jalapa Choisy, Conv. Rar. 125. 1837. — In DC. Prodr. 9: 338. 1845.

Leaf-blades triangular-ovate, entire or 3-lobed, plicate-veined; peduncles usually very short, 1-flowered; sepals subequal, broadly ovate, obtuse or rounded, 9–12 mm. long; the slender corolla pink or purple.

TYPE LOCALITY: Near Vera Cruz, Mexico.

DISTRIBUTION: Gulf region of Mexico to Venezuela.

ILLUSTRATIONS: Bot. Mag. *pl.* 1572. Bot. Cab. *pl.* 518. Wagner, Pharm. *pls.* 151, 152. Nees & Esenbeck, Off. Pfl. 1: *pl.* 197, 198. Cassone, Fl. Med. Farm. *pl.* 349. Woodv. Med. Bot. *pl.* 21. Plench, Ic. Pl. Med. *pl.* 94.

SPECIMENS EXAMINED: San Luis Potosi, *Pringle* 3511, 1890 (G). Venezuela; *Fendler* 2083 (G).

92. *Ipomœa leonensis* Robinson, Proc. Am. Acad. 26: 170. 1891.

Leaf-blades palmately 5-lobed, 6–12 cm. broad, punctate above, with a soft, deciduous, white tomentum beneath, lobes obtuse; sepals ovate, rounded, about 8 mm. long, canescent; corolla 5–7 cm. long.

TYPE LOCALITY: Near Monterey, Mexico.

DISTRIBUTION: Calcareous ledges Nuevo Leon to Oaxaca.

SPECIMENS EXAMINED: Monterey, *Pringle* 2840, 1889 (type — G). San Luis Potosi, *Pringle* 5040, 1891 (G). Oaxaca; Cerro de Huanculla *Conzattii* & *Gonzalez* 1215, 1901 (G).

93. *Ipomœa lacteola* nom. nov.

Ipomœa calophylla Wright; Griseb. Cat. Pl. Cub. 204. 1866. Not *I. calophylla* Fenzl. 1844.

Leaf-blades oblong, 4–8 cm. long, softly pubescent above, silvery-pubescent beneath; petioles 1–3 cm. long; sepals unequal, rounded or obtuse; corolla 5–6 cm. long.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba and Isle of Pines.

SPECIMENS EXAMINED: Cuba; *C. Wright* 3098 (co-type — C).

94. *Ipomœa hypargyrea* Griseb. Cat. Pl. Cub. 204. 1866.

A twining woody vine, appressed silvery-pubescent; leaf-blades oblong-lanceolate, subcordate, 4–8 cm. long, glabrate above, silvery beneath; short petioled; peduncles 1–3-flowered; sepals chartaceous, glabrous, subequal, obtuse; corolla 6–7 cm. long, campanulate above the ventricose base, rose-purple; capsules exceeding the calyx.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba.

SPECIMENS EXAMINED: *C. Wright* 449, (Herb. Gray, in part) No. 449 is cited under *I. argentifolia* A. Rich., and part of the Gray herbarium sheet is that species.

95. *Ipomœa passifloroides* sp. nov.

Perennial, densely villous-pubescent; leaf-blades broadly ovate, cordate, 4–7 cm. long, subequally 3-lobed, lobes shallow, often rounded, velvety appressed-pubescent above and beneath; petioles short; the short peduncles 2- to 5-flowered; bracts ovate, obtuse, 6–8 mm. long; pedicels densely hirsute; calyx glabrous; sepals chartaceous, suborbicular, scarious-margined, 7–9 mm. long; corolla glabrous, purple, campanulate-funnelform above the strongly ventricose base, 4–5 cm. long, tube 12–14 mm. thick above, the limb 22–25 mm. broad, slightly 5-lobed; capsules black, glabrous, 2-celled, 4-seeded; seeds minutely pubescent, hirsute on the angles.

CUBA: Jiquarito Mountain, Sierra Maestra, 3400 ft. alt. *Norman Taylor* 504, Sept. 18, 1906 (type — Y). A specimen collected by *Wright* without number in Herb. Gray, "Pinal San Juan de B., Nov. 24."

96. *Ipomœa rupicola* sp. nov.

Related to *I. jalapa*. Trailing or twining from a woody, enlarged root; tomentulose, becoming glabrate; leaf-blades triangular-ovate, cordate-hastate, 2–5 cm. long and as broad, acuminate, basal auricles acute or obtuse often bifid; petioles longer than the blades; peduncles 1–1.5 cm. long, 1-flowered; bracts minute; pedicel 1 cm. long, or less; sepals equal, oblong to oblong-ovate, obtuse or the outer ones subacute, tomentose or sericeous, 12–14 mm. long; corolla pubescent in bud and on the plicæ without when expanded, funnelform, 6–7 cm. long, the blue or purple limb 6 cm. broad.

MEXICO: Tamaulipas; Jonmave Valley, 2000 ft. alt. *E. W. Nelson* 4448, 1898 (type — 332519 — N, G).

97. *Ipomœa nicoyana* sp. nov.

A high-twining, woody, perennial vine with terete stems; finely pubescent; leaf-blades oblong-ovate, shallowly-cordate or cordate-sagittate, acuminate, 10–20 cm. long, finely pubescent, roughly so above, reticulate-veined beneath; petioles shorter than the blades; peduncles shorter than the petioles, 3-several flowered; sepals equal, lanceolate, abruptly acute, 12 mm. long, pubescent or glabrate, chartaceous in fruit; pedicels 10–15 mm. long; corolla campanulate above the strongly ventricose base, 5–6 cm. long, purple, the white tube 15–18 mm. in diameter; capsules ovoid, apiculate, thick-walled, 15 mm. high, 2-celled; seeds densely lanate.

COSTA RICA: Forests near Nicoya, *Tonduz* 13671, 1900 (type — Y).

98. *Ipomœa calantha* Griseb. Cat. Pl. Cub. 202. 1866.

Stems woody, muricate in lines, glabrescent below; leaf-blades orbicular-ovate to oblong-ovate, cordate, acute, entire, glabrous above, pubescent beneath, 5–8 cm. long; petioles as long; peduncles 1- to 5-flowered; sepals equal, ovate, obtuse, 10–13 mm. long; corolla rose-colored or nearly white, 8–10 cm. long, ventricose at the base; capsules 12 mm. in diameter.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba and Porto Rico.

SPECIMENS EXAMINED: Cuba; Bahia Honda, *C. Wright* 3091 (co-type — G, N). Porto Rico: Coano, *Sinten* 3128, 1886 (G).

99. *Ipomœa cyanantha* Griseb. Fl. Br. W. Ind. 469. 1861.

TYPE LOCALITY: Mountains of St. Andrews, Manchester, Jamaica.

DISTRIBUTION: Forests, mountains of Jamaica.

SPECIMENS EXAMINED: Road to Flamstead, 1200 ft alt. *Harris* 9034, 1905 (Y). Sheldon, Blue mountains, 2500 ft. alt. *Fawcett* (ex herb. Bot. Dept. Jam.) 10078, 1907 (Y).

100. *Ipomœa obtusata* Griseb. Cat. Pl. Cub. 202. 1866.

A slender, herbaceous glabrous vine; leaf-blades ovate-oblong or deltoid-ovate, cordate, obtuse or acute, margins repand or irregularly lobed, often 3-lobed with 2–4 lateral acuminations, 2–6 cm. long; short petioled; peduncles longer than the petioles, 2–5-flowered; pedicels about 1 cm. long; sepals ovate, rounded, subequal, 6–8 mm. long; corolla purple, campanulate above the ventricose base, limb 3 cm. broad with 5, short, rounded lobes; capsules globose.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba.

SPECIMENS EXAMINED: *C. Wright 3092* (co-type—C, G). A specimen in the Nat. Herb. without number, and labelled *I. alterniflora* is identical.

101. ***Ipomœa carnea*** Jacq. Enum. 13. 1760.—Select. Stirp. Am. Hort. 26. 1763.—Choisy in DC. Prodr. 9: 374. 1845.

Convolvulus carneus Spreng. Syst. 1: 602. 1825.

Convolvulus pareiræfolius Bert.; Spreng. l. c. 613.

Ipomœa pareiræfolia G. Don, Gen. Syst. 4: 273. 1838.

Batatas pareiræfolia Choisy, Conv. Rar. 123. 1837.—In DC. Prodr. 9: 337. 1845.

TYPE LOCALITY: Near Cartagena (Colombia).

DISTRIBUTION: Thickets near the coast, West Indies and Central America to Brazil.

ILLUSTRATIONS: Jacq. Stirp. Am. Hort. *pl.* 18.

SPECIMENS EXAMINED: Jamaica: *Harris*, Jan. 1894 (J). Nicaragua: *C. Wright* (U. S. North Pacific Expl. Exped.) (C). Panama, *Cowell 171*, 1905 (Y).

102. ***Ipomœa microsticta*** Hallier f. in Bull. Herb. Boiss. 7: 411. 1899.

Stems slender, woody, glabrous, terete; leaf-blades ovate, entire, cordate, 4–9 cm. long, submembranaceous, acuminate, densely and minutely black-puncticulate beneath with microscopic glands; lateral veins about 8 pairs; petioles with a pair of punctiform nectaries at the summit; peduncles stout, 4–14 cm. long, many-flowered; pedicels slender, angled, subclavate, 10–13 mm. long; sepals elliptical, convex, coriaceous, unequal, inner ones 6 mm. long; corolla purple, strongly ventricose at the base, 4–5 cm. long.

TYPE LOCALITY: Near Santa Lucia Cozumalhuapa, Guatemala.

DISTRIBUTION: Forests of Central America.

SPECIMENS EXAMINED: *Seler 2427*, 1896 (dupl. type—G).

15. ***Pedatisectæ***. Slender, herbaceous-stemmed, twining or erect, annual or perennials with or without tuber-like roots: leaf-blades pedately or rarely palmately parted, rarely cuneate and subentire in *I. madrensis* and *I. egregia*; corolla usually small, rarely elongated (*I. leptosiphon* and *I. tenuiloba*), funnel-form, never, ventricose at the base.

Leptocallis G. Don, Gen. Syst. 4: 260. 1838.

Annuals or perennials without tuber-like roots.

Stems erect, slender and weak; corolla 15 mm. long or less.

Leaf-blades ternate.

103. *I. ternifolia*.

- Leaf-blades pedately 5-9-divided.
 Sepals equal; corolla rose-purple. 104. *I. costellata*.
 Sepals unequal; corolla cream-colored with a
 purple throat. 105. *I. painteri*.
 Stems trailing or twining.
 Corolla 15 mm. long or less; leaf-blades palmately
 divided. 106. *I. wrightii*.
 Corolla 3-8 cm. long.
 Sepals attenuate-acuminate; corolla 4 cm. long.
 Foliage pubescent; segments of the leaf-blades
 entire; sepals keeled.
 Leaf-blades pilose and ciliate. 107. *I. delphinifolia*.
 Leaf-blades finely pubescent. 108. *I. leptotoma*.
 Foliage glabrous; segments of the leaf-blades
 toothed. 109. *I. divergens*.
 Sepals lanceolate, acute.
 Segments of the leaf-blades oblong-lanceolate
 and obtuse.
 Corolla 3 cm. long, funnelform. 110. *I. pedatisecta*.
 Corolla 5 cm. long, subsalverform. 111. *I. valida*.
 Segments of the leaf-blades acute or acuminate.
 Sepals glabrous; corolla 7-8 cm. long. 112. *I. tenuiloba*.
 Sepals setosely-hirsute; leaf-blades densely
 sericeous-pubescent. 113. *I. pilosissima*.
 Perennials, from tuberous-like roots.
 Leaf-blades with 5-7, linear or filiform segments.
 Corolla white, 8-10 cm. long; stems twining. 114. *I. leptosiphon*.
 Corolla purple, 2-5 cm. long.
 Leaf-blades sessile or petioles shorter than the
 blades; peduncles shorter than the petioles.
 Sepals 5-6 mm. long, or less.
 Plant strict, the filiform leaf-segments rare-
 ly over 1 cm. long. 115. *I. muricata*.
 Plant lax and branching, the linear-spatu-
 late leaf-segments 1-3 cm. long. 116. *I. patens*.
 Sepals 7-9 mm. long; peduncles 1-3 cm. long. 117. *I. plummeræ*.
 Leaf-blades long-petioled; sepals unequal. 118. *I. lemmonii*.
 Leaf-blades entire or cuneate at the base.
 Blades with 1-2 obliquely ascending lobes at the
 base. 119. *I. madrensis*.
 Blades incised-dentate at the broad apex. 120. *I. egregia*.

103. *Ipomœa ternifolia* Cav. Ic. 5: 52. pl. 478. f. 1. 1794.—Choisy in
 DC. Prodr. 9: 353. 1845.

Convolvulus ternifolius Spreng. Syst. 1: 613. 1825.

Leptocallis ternata G. Don, Gen. Syst. 4: 260. 1838.

TYPE LOCALITY: Acapulco, Mexico.

Not known by any recent collection.

104. *Ipomœa costellata* Torr. Bot. Mex. Bound. 149. 1859.— A. Gray, Syn. Fl. N. Am. 2¹: 214. 1878.

TYPE LOCALITY: Mouth of the Pecos River, western Texas.

DISTRIBUTION: Arid regions of western Texas, New Mexico, Arizona south to the Valley of Mexico.

SPECIMENS EXAMINED: Texas; *Wright* 505 (type—G, C, N); *Havard* 47, 1883; *Hayes*, 1858; *Neally* 624, 1889; *Coues & Palmer* 29, 1865 (G). New Mexico; *Fendler* 665, 1847 (G); *Wright* 1615 (G, C); *Earle* 331, 1900 (Y); *Rusby* 299, 1881 (C); *Metcalfe* 766, 1903 (Y); *Parry* 997 (C); *Mulford* 1111, 1895 (Y). Arizona; *Lemmon* 442, 1881 (N, Y); *Wilcox* 351, 1894 (N); *Griffiths* 5976, 1903 (N); *Toumey*, 1894 (Y); *Pringle*, 1884 (C); *Rothrock* 623a, 631, 520, 679, 1874; *Thurber* 1057, 1851 (G).

Lower California, *Brandeggee*, 1893; *Durango, Palmer* 649, 1896 (N, Y, G); *Coahuila; Palmer* 2095, 1880 (N, G); *Sonora; C. E. Lloyd* 430, 1894 (G); *Chihuahua; Townsend & Barber* 383, 1899 (N, Y, G); *Palmer* 104, 1885 (N, C). Valley of Mexico, *Borgeau* 726, 1865–66 (G).

105. *Ipomœa painteri* House, Muhlenbergia 3: 41. pl. 3. f. 1. 1907.

Resembling *I. costellata*; stems finely hirsute; sepals broadly lanceolate, the outer ones 5 mm. long, the inner 6–8 mm. long; each plicæ of the limb ending in 2, minute, black cusps at the margin.

TYPE LOCALITY: Guadeloupe, Federal Dist., Mexico.

DISTRIBUTION: Stony hillsides, central Mexico.

SPECIMENS EXAMINED: *Rose & Painter* 6826, 1903 (type—N); *Queretaro; Hacienda Ciervo, San Juan del Rio, Rose, Painter & Rose* 9632, 1905 (N, Y).

106. *Ipomœa wrightii* A. Gray, Syn. Fl. N. Am. 2: 213. 1878.

TYPE LOCALITY: Western Texas.

DISTRIBUTION: Western Texas.

SPECIMENS EXAMINED: *Wright* (type—G). Apparently closely related to, if not identical with *I. pulchella*.

107. *Ipomœa delphinifolia* Mart. & Gal. Bull. Acad. Brux. XII. 2: 265. 1845.—Walp. Rep. 6: 535. 1847.

Closely related to *I. leptotoma*, but described as having pubescent and pilose-ciliate leaf-blades; sepals about 6 mm. long, and corolla 4–5 cm. long, purple.

TYPE LOCALITY: Tehuacan, Puebla, Mexico. Not known by any recent collections.

108. *Ipomœa leptotoma* Torr. Bot. Mex. Bound. 150. 1859.—A. Gray, Syn. Fl. N. Am. 2¹: 214. 1878.

Ipomœa radiatifolia Kellogg, Proc. Cal. Acad. I. 7: 163. 1877.

Pharbitis leptotoma Peter, in Engl. & Prantl. Nat. Pflanzenfam. IV. 3a: 32. 1891.

TYPE LOCALITY: Near Santa Cruz Valley, Sonora, Mexico.

DISTRIBUTION: Arid mountain regions of southern New Mexico, Arizona and south to Oaxaca.

SPECIMENS EXAMINED: New Mexico; *Wright 1614*, 1851 (G, C); Arizona; *Dr. Smart 405*, 1867 (C); *Lemmon 3039*, 1883 (G, N, Y); *Pringle*, 1884 (Y); *Wilcox 417*, 1894 (N); *Toumey 179*, 1892. *Lemmon 90*, 1880 (G). Sonora; *Thurber 977*, 1851 (type — G); *Palmer 25*, 1869 (G, N); *Schott*, 1855 (C); *Lumholtz 195*, 1880 (Y); *Palmer 1705*, 1891 (N, Y); *C. V. Hartman 195*, 1890 (G); *C. E. Lloyd 431*, 1890 (G); Sinaloa; *Goldman 250*, 1898 (N); Oaxaca; *L. C. Smith 242*, 1894 (G); *Conzatti & Gonzalez 792*, 1897 (G); Puebla, *E. W. Nelson 1995*, 1894 (N).

109. *Ipomœa divergens* House, Muhlenbergia 3: 40. 1907.

Closely related to *I. leptotoma*; leaf-segments broader, sinuately toothed or lobed, obtuse; sepals acuminate, glabrous.

TYPE LOCALITY: Guaymas, Sonora, Mexico.

DISTRIBUTION: Western Mexico.

SPECIMENS EXAMINED: *Palmer 231*, 1887 (type — N, G).

110. *Ipomœa pedatisecta* Mart. & Gal. Bull. Acad. Brux. XII. 2: 265. 1845.—Walp. Rep. 6: 535. 1847.

TYPE LOCALITY: Near Oaxaca, Mexico.

DISTRIBUTION; Canons and barrancas, western and southern Mexico.

SPECIMENS EXAMINED: Colima; Acapulco, *Palmer 234*, 1894–5 (G, C); Jalisco; barranca of Tequila, *Pringle 4439*, 1893. Morelos; *Rose & Painter 6586*, 1903; *Rose, Painter & Rose 8550, 8569*, 1905. Guerrero; La Lagunilla, *E. W. Nelson*, 1903 (N); Iguala, *Rose, Painter & Rose 9293, 9341*, 1905. Puebla; Tehuacan, *Rose, Painter & Rose 9904*, 1905. Oaxaca; Tecomavara, *Seler 1339b*, 1895 (G); Domingiullo, *E. W. Nelson 1597*, 1894 (N); Oaxaca, *Conzatti & Gonzalez 1064*, 1900 (G).

111. *Ipomœa valida* House, Muhlenbergia 3: 40. pl. 1. f. d. 1907.

TYPE LOCALITY: Manzanillo, Mexico.

DISTRIBUTION: Thickets, Colima, Mexico.

SPECIMENS EXAMINED: *Palmer 1031*, 1890 (type — N).

112. *Ipomœa tenuiloba* Torr. Bot. Mex. Bound. 148. 1859.— A. Gray, Syn. Fl. N. Am. 2: Suppl. 434. 1886.

TYPE LOCALITY: Near Puerto de Paysano, western Texas.

DISTRIBUTION: Hills and rocky places, western Texas to southern Arizona and adjacent Mexico.

SPECIMENS EXAMINED: Near Puerto de Paysano, *Bigelow* (type—C); *C. Wright 1617*, (G). Valley of the Rio Grande, below Donana, *Parry 989* (G).

113. *Ipomœa pilosissima* Mart. & Gal. Bull. in Acad. Brux. XII. 2: 264. 1845.— Walp. Rep. 6: 535. 1847.

Slender, twining, pilose or hirsute; leaf-blades 5- to 7-pedately parted, the segments ovate-oblong, 3-5 cm. long, acuminate or attenuate, densely sericeous-pilose; peduncles 5-7 cm. long, 1-flowered; sepals densely setaceous-hirsute, lanceolate, acute, equal; corolla campanulate-funnelform, purple, 4-5 cm. long.

TYPE LOCALITY: Sierra de Yavezia, and near Oaxaca, Mexico. Not known by any recent collections.

114. *Ipomœa leptosiphon* S. Wats. Proc. Am. Acad. 23: 280. 1880.

Leaf-segments 5, filiform, 4-6 cm. long; peduncles 1-flowered; sepals unequal, oblong-lanceolate, acute, 8-10 mm. long, the outer ones muricate-keeled; corolla slender, 8-10 cm. long, white with a pink or rose-colored limb.

TYPE LOCALITY: Near Chihuahua, Mexico.

DISTRIBUTION: Thin gravelly soil, northern Mexico.

SPECIMENS EXAMINED: Chihuahua; *Pringle 1337*, 1887 (type—G, C, N); *Townsend & Barber 271*, 1889 (N, Y); *E. W. Nelson 4822*, 1898 (N); *E. W. Nelson 6159a*, 1899 (N).

115. *Ipomœa muricata* Cav. Ic. 5: 52. pl. 478. f. 2. 1794. Not *I. muricata* Jacq. 1798.

Convolvulus capillaceus H. B. K. Nov. Gen. & Sp. 3: 97. 1819.

Ipomœa armata Roem. & Schult. Syst. 4: 214. 1819.

Cantua tuberosa Roem. & Schult. l. c. 893.

Ipomœa capillacea G. Don, Gen. Syst. 4: 267. 1838.— Choisy in DC. Prodr. 9: 353. 1845.— A. Gray, Syn. Fl. N. Am. 2: Suppl. 434. 1886.

Leptocallis quinta G. Don, l. c. 260.

Leptocallis armata G. Don; Sweet, Hort. Brit. ed. 3, 482. 1839.

Quamoclit pedata Mart. & Gal. Bull. in Acad. Brux. XII. 2: 270. 1845.

TYPE LOCALITY: "Habitat in Huanajuato."

DISTRIBUTION: New Mexico and Arizona to northern South America.

SPECIMENS EXAMINED: New Mexico; *Rusby* 301, 1881; Arizona; *Leiberg* 5898, 1901; *Rothrock* 623, 1874; *Wilcox* 348, 1894; *Lemmon* 443, 1881 and 2836, 1882; *Neally* 187, 1891; *Griffiths* 5432, 1903. Lower California, *Brandege*, 1899.

Sonora; *Thurber* 964, 1851 (G). Lower California; *Brandege*, 1899 (N). Durango; *Palmer* 302, 1896 (N, G, Y); *E. W. Nelson*, 4640, 1898 (N). Chihuahua; *Pringle* 580, 1885 (G). Tepic; *Rose*, 1897 (N); Quere-taro; *Rose, Painter & Rose* 9540, 1905 (N); Jalisco; *Barcena* 562, 1887 (M); *Pringle* 11048, 1902 (N, Y). Federal Dist. *Coulter* 1036 (G); *Rose Painter & Rose* 8515, 1905 (N). Oaxaca; *Rev. Lucius C. Smith* 472, 1895 (G). Chiapas; *E. W. Nelson* 2879, 2946, 1895 (N).

116. *Ipomœa patens* (A. Gray) comb. nov.

Ipomœa muricata Roth. Bot. Wheeler 204. 1878. Not *I. muricata* Cav. 1794.
Ipomœa capillacea var. *patens* A. Gray, Syn. Fl. 2: Suppl. 434. 1886.

TYPE LOCALITY: Southern Arizona.

DISTRIBUTION: Southern New Mexico, Arizona and adjacent Mexico.

SPECIMENS EXAMINED: New Mexico; *C. Wright* 1616, 1851 (type—G. C). *O. B. Metcalfe* 271, 1903 (G). Arizona; *Wilcox*, 1893 (N); Sonora; *Thurber* 967, 1851 (C); Chihuahua; *Pringle* 841, 1886 (C, N); 1340, 1887 San Luis Potosi; *Parry & Palmer* 626, 1878 (G, N). Coahuila, *Palmer* 910, 1880 (N, G).

117. *Ipomœa plummeræ* A. Gray, Syn. Fl. N. Am. 2: Suppl. 434. 1886.

TYPE LOCALITY: Southern Arizona.

DISTRIBUTION: Gravelly slopes of the higher mountains of southern Arizona and New Mexico to Chihuahua, Mexico and in the Bolivian Andes.

SPECIMENS EXAMINED: Arizona; *Lemmon* 2839, 1882 (type—G); *Toumey* 1894; *MacDougal* 382, 1898 (Y); *Dr. Lour* 324, 1873 (G); *Wright* 1616 in part (G). New Mexico; *Earle* 492, 1900 (Y). Chihuahua; *Townsend & Barber* 228, 1899 (N); *E. W. Nelson* 6085, 1899 (N).

118. *Ipomœa lemmoni* A. Gray, Proc. Am. Acad. 19: 90. 1883.—
Syn. Fl. N. Am. 2: Suppl. 434. 1886.

TYPE LOCALITY: Mountains near Ft. Huachuca, Arizona.

DISTRIBUTION: Mountains and canons of southern Arizona.

SPECIMENS EXAMINED: *Lemmon* 2840, 1882 (type—G, N).

119. *Ipomœa madrensis* S. Wats. Proc. Am. Acad. 23: 281. 1888.

Peduncles 1-flowered, 1–2 cm. long, scabrous; sepals ovate, acute or obtuse 8–10 mm. long, mucronate; corolla 3–4 cm. long.

TYPE LOCALITY: Base of the Sierra Madre, Chihuahua, Mexico.

DISTRIBUTION: Pine plains, northern Mexico.

SPECIMENS EXAMINED: *Pringle* 1888, 1887 (type — G, C, N).

120. *Ipomœa egregia* House, *Torreya* 6: 124. 1906.

Ipomœa cuneifolia A. Gray, Proc. Am. Acad. 19: 90. 1883.—Syn. Fl. N. Am. 2: Suppl. 434. 1886. Not *I. cuneifolia* Meissn. 1869.

TYPE LOCALITY: Tanner's Canon, Ft. Huachuca, southern Arizona.

DISTRIBUTION: Mountains of southern Arizona.

SPECIMENS EXAMINED: *Lemmon* 2837, 1882 (type — G, N).

16. *Microsepala*. Slender, annual or perennial, twining vines, with herbaceous stems: sepals small, less than 5 mm. long, equal or nearly so, often acute: corollas small, narrowly funnelform, not ventricose at the base.

Corolla yellow.

Leaf-blades sessile or very short petioled.

121. *I. amplexicaulis*.

Leaf-blades relatively long-petioled.

122. *I. microsepala*.

Corolla white or purple.

Corolla white, 10–15 mm. long; leaves pubescent above.

123. *I. filipes*.

Corolla-limb blue, about 20 mm. long; leaves glabrous above.

124. *I. turckheimii*.

120. *Ipomœa amplexicaulis* Fernald, Bot. Gaz. 20: 535. 1895.

Glabrous or sparingly hispid; leaf-blades ovate, deeply cordate, entire, clasping, 1.5–4 cm. long; peduncles 3–6 cm. long, 2- to 9-flowered; sepals 2–3 mm. long, lanceolate, acute; corolla 15–20 mm. long.

TYPE LOCALITY: Mountains near Zopelote, Tepic, Mexico.

DISTRIBUTION: Mountains of western Mexico.

SPECIMENS EXAMINED: Tepic; *Lamb* 576, 1895 (type — G, N, Y); Tuxtla, *Cacc. et Ed. Seler* 1900, 1896 (G). Durango; Chacala, *Goldman* 339, 1899 (N). Between Valle Banderas and Colomo, Tepic, *E. W. Nelson* 4154, 1897 (N).

122. *Ipomœa microsepala* Benth. Bot. Voy. Sulph. 136. 1844.—Walp. Rep. 6: 533. 1847.

Ipomœa nelsoni Rose, Contr. U. S. Nat. Herb. 1: 343. 1895.

Stems densely hirsute with spreading hairs; petioles as long as the leaf-blades; leaf-blades ovate, cordate, acuminate or obtuse, 3-8 cm. long; peduncles 2- to 4-flowered; sepals 2 mm. long, obtuse; corolla 2-2.5 cm. long; capsules about 4 mm. high.

TYPE LOCALITY: Near Acapulco, Mexico.

DISTRIBUTION: western Mexico.

SPECIMENS EXAMINED: Oaxaca, *E. W. Nelson 318*, 1894 (N, Y, G); Manzanillo, *Palmer 1363*, 1891 (G).

123. *Ipomœa filipes* Benth.; Meissn. in Mart. Fl. Bras. 7: 274. 1869.

Stems pubescent or glabrate; leaf-blades orbicular-ovate, 1-3 cm. long, acute, entire or angled, pubescent above, glabrous beneath; peduncles filiform, 5-8 cm. long, 1-3-flowered; pedicels recurved in fruit; sepals 2 mm. long; corolla 10-15 mm. long, white.

TYPE LOCALITY: About Santarem, on the Amazon River, Brazil.

DISTRIBUTION: Thickets, near the coast, western Mexico to Brazil.

SPECIMENS EXAMINED: Sinaloa; *Palmer 1647*, 1891 (N, Y). Guerrero; *Palmer 109*, 1894-5 (N, G, C). Guatemala: *W. C. Shannon (John Donnell Smith 4026)*, 1892 (G). Among the South American specimens of this are *Herbert H. Smith 1589*, 1898; *Fendler 2089* and *Spruce 886*.

Doubtless identical with *Convolvulus minutiflorus* Mart. & Gal.

124. *Ipomœa turckheimii* Vatke; J. Donnell Smith, Bot. Gaz. 40: 8. 1905.

Ipomœa concinna House, Muhlenbergia 3: 42. pl. 2. f. c. 1907.

Leaf-blades ovate, acuminate, cordate-hastate, 1.5-5 cm. long; petioles 2-5 mm. long, rarely longer; peduncles 3-5 cm. long, 3- to 7-flowered; sepals equal, outer ones acute, inner obtuse, corolla about 2 cm. long.

TYPE LOCALITY: Coban, Guatemala.

DISTRIBUTION: Southern Mexico and Central America.

SPECIMENS EXAMINED: Jalisco, *Barcena 553*, 1887 (M). Morelos, near Cuernavaca, *Pringle 7232*, 1896 (G). Guatemala: *H. von Tuerckheim* (ex J. D. Smith, Pl. Guat. 386), 1886 (co-type — G).

17. *Emeticæ*. Slender-stemmed vines, twining, stems herbaceous from perennial, tuber-like, thickened roots: leaf-blades entire, cordate or cordate-sagittate, usually glabrous: sepals very unequal, obtuse, membranaceous; corollas salverform or funnelform, usually purple.

Stamens and style exserted; corolla salverform.

Corolla limb 5 cm. broad or more, tube 5-8 cm. long. 125. *I. purga*.

- Corolla limb 2-3 cm. broad, tube 3-4 cm. long; leaf-blades strongly sagittate, long-caudate. 126. *I. emetica*.
 Stamens and style included; corolla not salverform.
 Leaf-blades ovate or orbicular-ovate, more than 3 cm. long.
 Corolla funnellform.
 Leaf-blades ovate; corolla 5-6 cm. long; sepals about 10 mm. long. 127. *I. seducta*.
 Leaf-blades cordate-sagittate.
 Corolla 4-5 cm. long; sepals 4-6 mm. long. 128. *I. simulans*.
 Corolla 8-10 cm. long, sepals 8-10 mm. long. 129. *I. elongata*.
 Corolla tubular, 5-6 cm. long and slightly bent; limb 15 mm. broad; leaf-blades 3-4 cm. long, cordate. 130. *I. urbinei*.
 Leaf-blades small, reniform-ovate, 1-2 cm. long or less; corolla 6-8 cm. long, very slender. 131. *I. suffulta*.

125. *Ipomœa purga* (Wender.) Hayne, Arzn. Gew. 12: pls. 33, 34. 1833. — Choisy in DC. Prodr. 9: 374. 1845. — Willis, Prac. Fl. 184. 1894.

Convolvulus jalapa Schiede, in Linnaea 5: 473. 1830. Not *C. jalapa* L. 1767.
Ipomœa jalapa Nutt. & Cox, in Am. Journ. Med. Sci. 5: 300-307. 1830. — Schiede & Deppe, in G. Don, Gen. Syst. 4: 271. 1838. Not *I. jalapa* Pursh, 1814.
Convolvulus purga Wenderoth, in Pharm. Centralb. 1: 457. 1830. — D. Dietr. Syn. Pl. 1: 667. 1839.
Ipomœa scheideana Zuccar. in Flora 14: 801. 1831. — Pl. Nov. vel Min. Cogn. 293. 1832.
Exogonium purga & *dumosum* Benth. Pl. Hartw. 46. 1840.
Convolvulus officinalis Pelletan; Steud. Nom. ed. 2, 1: 410. 1841.
Calonyction galeotii Mart. & Gal. in Bull. Acad. Brux. XII. 2: 268. 1845.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Mountain forests, central Mexico to Central America.

ILLUSTRATIONS: Hayne, l. c.; Nees Offic. Pfl. Suppl. 3: pl. 13. Berg. & Schmidt, Offiz. Gew. 1: pl. 5. Curt. Bot. Mag. pl. 4280. Am. Journ. Med. Sci. 1830. pl. 7. Benth. & Trin. Med. Bot. pl. 186. Zuccar. l. c. pl. 12. Royle, Ill. Himal. 308. Bot. Reg. pl. 49.

SPECIMENS EXAMINED: Vera Cruz; Muller 889, 1853 (C). Jalapa, Schiede 149, 1839 (C); A. Duges 3, 1906 (G); C. L. Smith 1930, 1894 (G); Trinidad, Pringle 8889, 1904 (G). Valle de Cordova, Borgeau 1730, 1865 (G). Zucupapan, Purpus 2212, 2392, 1907 (G, Y). Jalisco; Palmer 373, 1886 (G, C); E. W. Nelson 4022, 4085, 1897 (N). Durango, near Chacola, Goldman 331, 1899 (N). Oaxaca; Rev. L. C. Smith 666, 1895 (G). Guatemala; Deam 317, 1905 (G, Y). J. Donnell Smith 2014, 1890 (G, Y, N). Costa Rica; Tonduz 1771, 1894 (K). Jamaica (introduced); Britton 155, 1906 (Y).

126. *Ipomœa emetica* Choisy in DC. Prodr. 9: 376. 1845.

Ipomœa caudata Fernald in Proc. Am. Acad. 36: 498. 1901.

Slender; leaf-blades thin, 3-5 cm. long, apex caudate-acuminate, base sagittate, basal lobes 1-2 cm. long, acuminate; corolla 5-6 cm. long, the limb 2-3 cm. broad.

TYPE LOCALITY: Tepelpæ circuitum Mexico.

DISTRIBUTION: Exposed places at high altitudes, central Mexico.

SPECIMENS EXAMINED; Sierra de Tepoxtlán, Morelos, *Pringle* 8448, 1900 (G, N, Y). *Pringle* 13590 (G).

127. *Ipomœa seducta* sp. nov.

Closely resembling *I. purga*; glabrous, perennial from a tuberous root; leaf-blades orbicular-ovate, cordate, 6-10 cm. long, acuminate, basal sinus often closed, pale beneath; petioles short; peduncles as long as the petioles, usually 1-flowered; sepals unequal, outer ones lanceolate, 4-5 mm. long, acute, inner fully 10 mm. long, subacute or obtuse; corolla 5-6 cm. long, funnelform, the whitish tube expanding from the base, constricted within the calyx, limb purple, 5 cm. broad; stamens and style included.

GUATEMALA; Cubilquitz, Alta Verapaz, *Tuerckheim* (J. Donnell Smith distr. 7926), 1901 (type — C). Cobán, *Tuerckheim* (J. Donnell Smith distr. 101), 1887 (C). MEXICO; Chiapas, Near Yajalon *E. W. Nelson* 3403, 1895 (252535 — N).

128. *Ipomœa simulans* Hanbury, Journ. Linn. Soc. 11: 281. 1871.

Leaf-blades ovate-lanceolate, 5-8 cm. long, caudate-acuminate, base cordate-sagittate, basal lobes acute or rounded, 1 cm. long, glaucous beneath; sepals unequal, inner ones 4-6 mm. long; corolla 4-6 cm. long, purple with a white tube.

TYPE LOCALITY: Mexican Andes, Piedra Gorda district, Guanajuato; also the cold regions of Oaxaca.

DISTRIBUTION: High altitudes of central and southern Mexico.

SPECIMENS EXAMINED: Mechoacan, *Schiede* (G). Morelos, *Pringle* 6565, 1896 (G, N, C). Oaxaca; *E. W. Nelson* 1184 (in part), 1894 (N, G).

129. *Ipomœa elongata* Choisy in DC. Prodr. 9: 355. 1845.— Hallier f. in Bull. Herb. Boiss. 5: 1052. 1895.

Calonyction dubium Mart. & Gal. Bull. in Acad. Brux. XII. 2: 268. 1845.

Ipomœa dubia Hemsley, Biol. Cent.-Am. Bot. 2: 386. 1882. Not *I. dubia* Roem. & Schult. 1819.

Ipomœa mestecensis House, Bot. Gaz. 43: 411. 1907.

Glabrous or pubescent; leaf-blades ovate-lanceolate, sagittate or cordate-sagit-

tate, acuminate, 3–5 cm. long, basal lobes produced, half as long as the blade, acute, divergent; peduncles 1-flowered; sepals lanceolate, acute; corolla rose-purple, limb deeply 5-lobed.

TYPE LOCALITY: Near Oaxaca, Mexico (*Andrieux 212*).

DISTRIBUTION: Mountains of Oaxaca.

SPECIMENS EXAMINED: *Pringle 4693*, 1894 (G, N, C). *C. L. Smith 910*, 1894 (Y, G); *Rev. Lucius C. Smith 334*, 1895 (G).

130. *Ipomœa urbinei* House, Muhlenbergia **3**: 41. *pl. 2, f. b.* 1907.

Resembling *I. simulans*; leaf-blades glaucous and densely pubescent beneath; peduncles 1–2-flowered, slightly longer than the petioles and somewhat confluent with them at the base; sepals unequal, the inner 8–10 mm. long and 2–3 times as long as the outer; corolla scarlet, tubular.

TYPE LOCALITY: Faldas del Volcan de Colima, Mexico.

DISTRIBUTION: Known only from the type locality (*Barcena 214*, 1881, type—M).

131. *Ipomœa suffulta* (H. B. K.) G. Don, Gen. Syst. **4**: 276. 1838.

— Robinson & Greenm. Am. Journ. Sci. **50**: 160. 1895.

— Hallier f. Bull. Herb. Boiss. **7**: 411. 1899.

Convolvulus suffultus H. B. K. Nov. Gen. & Sp. **3**: 102. 1819.

TYPE LOCALITY: On the volcanic mountain of Jorullo, Mexico.

DISTRIBUTION: Mountains of Oaxaca, Mexico.

ILLUSTRATIONS: H. B. K. l. c. *pl. 211*.

SPECIMENS EXAMINED: *Pringle 4755*, 1894 (G, N, C). *E. W. Nelson 1541*, 1894 (N, G); *3061*, 1895 (N); *2920*, 1895 (N G). *Rev. L. C. Smith 141*, 1894 (G).

18. *Anisomeræ*. Twining, annual or perennial vines of various habit; stems sometimes woody below, usually not densely pubescent; leaf-blades entire or 3-lobed or toothed, rarely somewhat 5-lobed; sepals coriaceous, very unequal.

Leaf-blades linear to broadly lanceolate; corolla small.

Leaf-blades denticulate-hastate at base; corolla white. 132. *I. angustifolia*.

Leaf-blades sagittate or cordate-sagittate.

Corolla crimson or purplish.

133. *I. tenuissima*.

Corolla white; leaf-blades subsessile.

134. *I. sagittula*.

Leaf-blades ovate in outline.

Sepals obtuse or merely subacute, not cuspidate.

Leaf-blades broadly hastate at the base; thick-textured, basal lobes acute.

135. *I. callida*.

Leaf-blades cordate or truncate at the base.

Leaf-blades deeply 3-lobed or sub 5-lobed.

Corolla white.

Inner sepals 6 mm. long. Haytian. 136. *I. buchii*.

Inner sepals 10-12 mm. long. Mexican. 137. *I. rhomboidea*.

Corolla blue or purple; inner sepals 8-10 mm. long. 138. *I. vulsa*.

Leaf-blades entire or merely toothed.

Peduncles elongated, exceeding the leaves.

Blades toothed near the base; sepals 8-10 mm. long. 139. *I. splendor-sylvæ*.

Blades not toothed; sepals 8-12 mm. long. 140. *I. phillomega*.

Peduncles not exceeding the leaves.

Corolla yellow. 141. *I. lindenii*.

Corolla purple or white.

Peduncles many-flowered; corolla purple, slender-funnelform. 142. *I. wilsoni*.

Peduncles 3-5-flowered.

Corolla white, 4-5 cm. long. 143. *I. anisomeres*.

Corolla blue, 2 cm. long; leaf-blades hastately lobed at base. 144. *I. oligantha*.

Sepals cuspidate-acute.

Stems and leaves densely pilose-pubescent; blades 3-lobed; sepals ciliate; corolla rose-purple. 145. *I. purpusi*.

Stems and leaves glabrous or nearly so.

Leaf-blades deeply 3-5-lobed; sepals 8-14 mm. long; corolla purple. 146. *I. collina*.

Leaf-blades entire, toothed or slightly 3-lobed.

Corolla purple or yellowish-purple.

Inner sepals broadly obovate; corolla 3-3.5 cm. long. 147. *I. gracilis*.

Inner sepals oblong-lanceolate.

Sepals 10-14 mm. long; stems usually prostrate and blades usually lobed, glabrous. 158. *I. babatas*.

Sepals 8-10 mm. long; the pilose or pubescent stems usually twining. 159. *I. tiliacea*.

Corolla white, fading purple in drying; 6-8 cm. long; sepals about 15 mm. long. 148. *I. jicama*.

132. *Ipomœa angustifolia* ¹ Jacq. Coll. 2: 367. 1788.

Convolvulus angustifolius Desr. in Lam. Encyc. 3: 547. 1789.

Convolvulus filicaulis Vahl, Symb. Bot. 3: 24. 1794.

Convolvulus simplex Pers. Syn. 1: 178. 1805.

¹ *Ipomœa aprica* nom. nov.

Ipomœa angustifolia Choisy in DC. Prodr. 9: 367, 1845.—Meissn. in Mart. Fl. Bras. 7: 249. pl. 89 f. 2. 1869. Not *I. angustifolia* Jacq. 1788.

BRAZIL.

- Convolvulus filiformis* Thunb. Fl. Cap. 2: 168. 1823. Not *C. filiformis* Desr. 1789.
Ipomœa denticulata R. Br. Prodr. 485. 1810.
Convolvulus sonneratii Rees, Cyclop. No. 29. 1819.
Convolvulus denticulatus Spreng. Syst. 1: 603. 1825. Not *C. denticulatus* Desr. 1789.
Ipomœa filicaulis Willd. Sp. Pl. 1: 848. 1798.—Choisy in DC. Prodr. 9: 353. 1845.
Ipomœa filiformis Voigt. Hort. Suburb. Calc. 356. 1845. Not *I. filiformis* Jacq. 1763.
Ipomœa bidentata G. Don, Gen. Syst. 4: 266. 1838.
Frazima tridentata Raf. Fl. Tellur. 4: 83. 1838.
Merremia angustifolia Hallier f. Bot. Jahrb. 16: 552. 1893: 18: 117. 1894.

TYPE LOCALITY: Guyana.

DISTRIBUTION: Thickets and shores, circumtropical. Introduced on ballast about the seaports of the southern United States.

ILLUSTRATIONS: Rheed. Mal. 11: pl. 55. Bot. Reg. pl. 317. Jacq. Ic. Rar. pl. 317. Bot. Mag. pl. 5426.

SPECIMENS EXAMINED: On ballast, Brunswick, Georgia, *Harper 1523*, 1902 (G). Porto Rico: *Sintenis 6763*, 1887 (Y); *Heller 1276*, 1899; *6440*, 1903 (Y); *Underwood & Griggs 982*, 1901 (Y).

133. *Ipomœa tenuissima* Choisy in DC. Prodr. 9: 376. 1845.—Small, Bull. N. Y. Bot. Gard. 3: 434. 1905.

Slender and herbaceous above, from a perennial root; leaf-blades 2–5 cm. long; peduncles 4–6 cm. long, 1-flowered; sepals ovate-lanceolate, obtuse, mucronulate, 6–8 mm. long; corolla crimson, 3–4 cm. long.

TYPE LOCALITY: Desportes, Cuba.

DISTRIBUTION: Cuba, Isle of Pines and subtropical Florida.

SPECIMENS EXAMINED: Florida; Pinelands near Cutler, *Small & Carter 712, 750*, 1903; *1705, 1834, 1953*, 1904 (Y). Biscayne Bay, *Curtiss*, 1880 (Y). Dade Co. *Britton 163*, 1904 (Y). Cuba: "Open grassy places at Salvador and Savanas, Cayo del Rey," *C. Wright 1651*, Sept. 11, 1859 (G, C). Cieneguita, *Combs 238*, 1895 (Y). Madruga, *Britton & Shafer 680*, 1903 (Y). Pinar del Rio, *Shafer 558*, 1903 (Y). Matanzas, *Britton & Wilson 422*, 1903. Santa Clara, *Baker 2495*, 1904 (Y). Habana, *Van Hermann 980*, 1905 (Y). Isle of Pines, *Curtiss 495*, 1904 (G, Y).

134. *Ipomœa sagittula* sp. nov.

A slender, twining, perennial vine, with weak, woody stems, bark thin, whitish exfoliating; leaf-blades broadly lanceolate, acute and cuspidate, base sagittate, 4–7 cm. long, 1.5–3 cm. broad, the basal auricles 1 cm. long or less, obtuse and clasping the stem, glabrous above, minutely white-dotted beneath; petioles 2–6 mm.

long; peduncles 1.5–2 cm. long, 1- to 5-flowered, bracts minute; pedicels 1 cm. long; sepals unequal, obtuse, ovate-oblong, outer ones 3–5 mm. long, inner 5–7 mm. long; corolla white, funnelform, about 3 cm. long and as broad; capsules ovoid, 8–9 mm. long, 2-celled.

MEXICO: Jalisco; Between San Sebastian and Las Palmas, 3000–2500 ft. alt. *E. W. Nelson 4129*, Mar. 30, 1897 (type — N, G).

135. *Ipomœa callida* House, *Muhlenbergia* 3: 42. *pl. 3, Fig. b.* 1907.

Perennial, woody below; leaf-blades 6–12 cm. long, 4–6 cm. broad at the base, glabrous and glossy above, paler beneath; peduncles 5–10 cm. long, 5- to 10-flowered in a rather dense cyme; sepals 5 mm. long in the outer to 10 mm. long in the inner, rounded; corolla purple, 4.5–5 cm. long.

TYPE LOCALITY: Near Puerto Sierra, Honduras.

DISTRIBUTION: Known only from the type locality.

SPECIMENS EXAMINED: *Percy Wilson 534*, 1903 (type — Y).

136. *Ipomœa buchii* Urban, *Symb. Ant.* 3: 356. 1903.

Young stems minutely but sparingly pilose; leaf-blades 3-lobed or parted, 3.5–5 cm. long, 4–6 cm. broad, middle lobe ovate-elliptical, obtuse; peduncles 1-flowered, 6–12 cm. long; sepals pale-green, outer ones oval, 4.5 mm. long, rounded, inner 6 mm. long, subtruncate at apex; corolla white, 4–4.5 cm. long.

TYPE LOCALITY: Near Petite Coupe, mountains of Hayti, alt. 250 m.

DISTRIBUTION: Mountains of Hayti.

137. *Ipomœa rhomboidea* sp. nov.

A slender, twining vine from a perennial root; stems angled, minutely canescent; leaf-blades ovate, 3-lobed, shallowly cordate, 8–12 cm. long and as broad, lobes contracted below, suborbicular, obtuse, thin and submembranaceous, reticulate-veined, minutely pubescent; petioles 6–10 cm. long, very slender; peduncles 4–6 cm. long, 1- to 3-flowered; pedicels 1–3 cm. long, becoming 5 cm. long in fruit; sepals very unequal, outer oblong, obtuse, subcanescent, 7–9 mm. long, inner ones broader, rounded, 10–13 mm. long; corolla white, tinged with purple-mauve below, funnelform, constricted within the calyx, 6–7 cm. long, limb 5-lobed, 5–6 cm. broad, the lobes ending in minute cusps at the margin; capsules ovoid.

MEXICO: Sinaloa; Topolobampo, *Palmer 227*, Sept. 1897 (type — 315548 — N).

138. *Ipomœa vulsa* House, Muhlenbergia 3: 45. *pl.* 1. fig. *a, b.* 1907.

Glabrous, 1-2 m. long; leaf-blades 3- to 5-lobed, lobes oblong or obovate-lanceolate, blunt, 1.5-4 cm. long; peduncles 3-5 cm. long, 1-2-flowered; outer sepals obovate, 6 mm. long, inner ones broadly oblong, rounded and finely toothed, ciliate, 8-10 mm. long; corolla purplish, 3-4 cm. long.

TYPE LOCALITY: Orizaba, Mexico.

DISTRIBUTION: Vicinity of Orizaba, Mexico.

SPECIMENS EXAMINED: Müller, 1855 (type — 291646, 291644 — N, C).

139. *Ipomœa splendor-sylvæ* House, Muhlenbergia 3: 43. *pl.* 2. *f. a.* 1907.

Leaf-blades ovate, cordate, acuminate, sinuate-toothed near the base, 5-9 cm. long; peduncles 10-18 cm. long, 1- to 3-flowered; sepals 8-10 mm. long; corolla 5-6 cm. long, scarlet (when dried), strongly constricted at the base, limb subentire, 4 cm. broad.

TYPE LOCALITY: Puerto Sierra, Honduras.

DISTRIBUTION: Known only from the type locality.

SPECIMENS EXAMINED: Percy Wilson 286, 1903 (type — Y).

140. *Ipomœa phillomega* (Vell.) comb. nov.

Convolvulus phillomega Vell. Fl. Flum. (text) 74. 1825. Icones 2: *pl.* 63. 1827.

Ipomœa capparoides Choisy in Mém. Soc. Phys. Genève. 8: 59. 1839.— In DC.

Prodr. 9: 376. 1845.— Hallier f. in Jahrb. Hamb. Wiss. Anst. 16: 52. 1898.

Ipomœa parænsis Peter in Engl. & Prantl. Nat. Pfl. IV. 3a: 30. 1891.

Aniseia syringifolia Dammer; Bot. Jahrb. 23: Beibl. 57. 38. 1897.

TYPE LOCALITY: [Brazil.]

DISTRIBUTION: Costa Rica to Colombia, Venezuela, Martinique and Guadeloupe.

Reported from Martinique (*Belanger 1116*, Hb. Del.) and Guadeloupe (L'Herminier, Hb. Boiss.) by Hallier, l. c.

141. *Ipomœa lindenii* Mart. & Gal. Bull. in Acad. Brux. XII. 2: 264. 1845. Walp. Rep. 6: 535. 1847.

Twining, woody, glabrous; leaf-blades ovate, shallowly cordate, acuminate, mucronate, 5-10 cm. long; peduncles shorter than the petioles, 1- to 3-flowered, 5-10 mm. long; pedicels longer, 25-30 mm. long; sepals oblong, obtuse; corolla campanulate-funnelform, yellow, 3-5 cm. long.

TYPE LOCALITY: Near Zucuapan, Vera Cruz, Mexico. Not known by any recent collections.

142. *Ipomœa wilsoni* House, *Muhlenbergia* 3: 44. *pl. 1. f. c.* 1907.

Leaf-blades ovate, deeply cordate, acute, thick, basal lobes slightly angled; peduncles stout, as long as the petioles, cymosely many-flowered; inner sepals oblong, 8–10 mm. long, obtuse, outer ones suborbicular, smaller; corolla slender-funnelform, purple, 5.5–6 cm. long, limb about 4 cm. broad.

TYPE LOCALITY: Near Puerto Sierra, Honduras.

DISTRIBUTION: Known only from the type locality.

SPECIMENS EXAMINED: *Percy Wilson 530*, 1903 (type — Y).

143. *Ipomœa anisomeres* Robinson & Bartlett, *Proc. Am. Acad.* 43: 57. 1907.

Perennial, glabrous; leaf-blades ovate, cordate, acute, 6–11 cm. long, paler beneath; petioles 3–5 cm. long; peduncles 3.5–6 cm. long, cymosely many-flowered; sepals glabrous, white-margined, outer ones 1–3 mm. long and suborbicular, inner about 10 mm. long; corolla 6.5–7 cm. long, white with a purple throat, limb 4–5 cm. broad; capsules ovoid, 10–12 mm. long.

TYPE LOCALITY: Gualan, Guatemala.

DISTRIBUTION: Southern Mexico to Central America.

SPECIMENS EXAMINED: Puebla; Near Metlaltoyuca, *Goldman 67*, 1898 (N). Guatemala: Gualan, *Deam 318, 319*, 1905 (type — G).

144. *Ipomœa oligantha* Choisy in DC. *Prodr.* 9: 380. 1845.

Convolvulus pulchellus H. B. K. *Nov. Gen. & Sp.* 3: 101. 1819.

Convolvulus pauciflorus Willd.; Roem. & Schult. *Syst.* 4: 302. 1819.

Ipomœa pulchella G. Don, *Gen. Syst.* 4: 276. 1838. Not *I. pulchella* Roth, 1821.

Slender, twining, glabrous, perennial below; stems angled, puberulent; leaf-blades triangular-ovate, caudate-acuminate, cuspidate, deeply cordate, 5–10 cm. long, basal auricles laterally acute; petioles as long as blades, glandular-muricate at base; peduncles pubescent at base, 3- to 5-flowered; pedicels 1–2 cm. long; sepals subequal, ovate, acute or subobtuse, 5–6 mm. long; corolla about 2 cm. long, limb purple.

TYPE LOCALITY: Crescit in Regno Peruviano.

DISTRIBUTION: Southern Mexico to Bolivia and Brazil.

SPECIMENS EXAMINED: Mexico: Oaxaca, *E. W. Nelson 1148*, 1894 (N, G).

145. *Ipomœa purpusi* sp. nov.

Stems stout, perennial below, 1-several m. long, densely pilose; leaf-blades broadly ovate, 5-8 cm. long, cordate, deeply 3-lobed, acuminate, densely appressed-hirsute and green above, paler and densely pubescent beneath with less appressed hairs; petioles shorter than the blades; peduncles longer than the petioles, 4-10 cm. long, lanate above, 1- to 5-flowered; sepals oblong-lanceolate, acute and apiculate, inner ones 8-10 mm. long, glabrous but ciliate near the apex, outer ones shorter, pubescent and ciliate; corolla broadly campanulate-funnelform, about 3 cm. long and the limb as broad.

MEXICO: Zucupapan, *Purpus* 2213, 1906 (type—Y, N).

146. *Ipomœa collina* House, Bot. Gaz. 43: 412. fig. 2. 1907.

Petioles as long as the blades or shorter; peduncles stout, 1- to 5-flowered, 13-25 cm. long; sepals 8-14 mm. long, lanceolate, outer ones sparingly pubescent, inner cuspidate-acute, glabrous; corolla purple, 5-7 cm. long.

TYPE LOCALITY: Near Saltillo, Coahuila, Mexico.

DISTRIBUTION: Known only from the type locality.

SPECIMENS EXAMINED: *Palmer* 396, 1904 (type—N, Y).

147. *Ipomœa gracilis* R. Br. Prodr. 484. 1810. House, *Torreya* 7: 37, 38. 1907.

Convolvulus denticulatus Desr. in Lam. Encyc. 3: 540. 1789.

Convolvulus gracilis Spreng. Syst. 1: 604. 1825.

Ipomœa denticulata Choisy in Mém. Soc. Phys. Genève. 6: 467. 1833.—G. Don, Gen. Syst. 4: 276. 1838.—Choisy in DC. Prodr. 9: 379. 1845.

Not *I. denticulata* R. Br. 1810.

Ipomœa littoralis Blume, Bijdr. 713. 1826.—G. Don, l. c. 265.

Ipomœa cymosa Baker, Fl. Maurit. 208. 1877.

Ipomœa nicobarica Kurz, Jour. As. Soc. Beng. 45: 141. 1876.

Ipomœa choisiana W. F. Wight, Contr. U. S. Nat. Herb. 9: 298. 1905.

Ipomœa roseana House, Muhlenbergia 3: 43. 1907.

Perennial, glabrous, stems dark; leaf-blades ovate, cordate or cordate-hastate, obtuse or acute, mucronulate, 3-8 cm. long; peduncles 1- to 5-flowered, rarely many-flowered; sepals ovate, inner slightly longer, broad and rounded but minutely cuspidate at apex, outer ones narrower, lanceolate-oblong, acuminate-cuspidate, 6-8 mm. long; corolla purplish-pink, 4-5 cm. long.

TYPE LOCALITY: Cette espèce a été trouvée par Commerson dans les Isles Mahé, Sechelles & des trois Frères. (Desr.)

DISTRIBUTION: Circumtropical.

SPECIMENS EXAMINED: Mexico: Colima, *Palmer* 978, 1890 (N); Costa

Rica, *Tonduz* 13675, 1900 (Y). Cuba; *Pringle* 57, 1903 (G, Y). *Britton & Wilson* 8, 271, 1903 (Y). *Britton & Shafer* 578, 269, 1903 (Y). *Pol-lard, Palmer & Palmer* 272, 1902 (N, Y). *Underwood & Earle* 112, 1638, 1903 (Y). Isle of Pines, *Curtiss* 249, 1903 (G, Y, N). Bahamas: Great Bahama, *Brace* 3646, 1905 (Y). Jamaica; *Britton* 973, 1907 (Y). Hayti; *Nash* 349, 1903 (Y); *Nash & Taylor* 1043, 1905 (Y). Montserrat; *Shafer* 167, 654, 1907 (Y). Dominica; *Lloyd* 354, 1903 (Y). Porto Rico; *Heller* 6341, 1902 (Y); *Millsbaugh* 754, 1899 (Y). Culebra, *Britton & Wheeler* 127, 1906.

Most of the so-called *I. fastigiata*, of the American tropics doubtless belongs here.

148. *Ipomœa jicama* Brandegees, Bull. Cal. Acad. II. 2: 188. 1889.

TYPE LOCALITY: Magdalena Islands, Santa Margarita Island, San Jorge.

DISTRIBUTION: Lower California and Islands off the coast.

SPECIMENS EXAMINED: Magdalena Bay, Lower Calif. *Brandegee*, 1889 (N). Also fragment of type in Herb. Gray.

19. *Aequisepalæ*. Twining, perennial or annuals with entire or lobed leaf-blades and herbaceous or woody stems, glabrous or pubescent; sepals coriaceous, equal or nearly so, obtuse, acute or cuspidate; corolla purple, yellow or white.

Leaf-blades strongly sagittate; corolla purple.

149. *I. sagittata*.

Leaf-blades ovate or cordate-sagittate (in *I. polyanthes*).

Corolla yellow.

Corolla 2-3 cm. long; inflorescence umbellately many-flowered; foliage glabrate or finely pubescent.

150. *I. polyanthes*.

Corolla 4-5 cm. long; stems strongly hirsute.

151. *I. longipes*.

Corolla purple, blue or white.

A.

A. Sepals cuspidately pointed or acuminate.

Sepals ciliate or pubescent; annuals.

Corolla 3 cm. long, or longer.

152. *I. trichocarpa*.

Corolla less than 3 cm. long.

Peduncles longer than the petioles.

Corolla narrowly funnelform, 15 mm. long or less,

153. *I. triloba*.

Corolla broadly funnelform, about 20 mm. long.

154. *I. ramoni*.

Peduncles shorter than the petioles; corolla-tube white, limb often pink.

155. *I. lacunosa*.

- Sepals glabrous; perennials.
 Corolla 3 cm. long or less.
 Corolla 2-3 cm. long; leaf-blades petioled, 3-5-lobed, rarely subentire. 156. *I. trifida*.
 Corolla 15 mm. long; leaf-blades subsessile, entire. 157. *I. peninsularis*.
 Corolla 4 cm. long or more.
 Inner sepals broadly obovate, rounded, minutely cuspidate; outer ones lanceolate, cuspidate-acuminate. 147. *I. gracilis*.
 Inner sepals oblong-lanceolate, cuspidate-acuminate.
 Sepals 10-14 mm. long; stems usually glabrous and prostrate. 158. *I. batatas*.
 Sepals 8-10 mm. long; stems usually pubescent and twining. 159. *I. tiliacea*.
 Sepals obtuse, subacute or rarely awned. B.
 B. Sepals aristately awned; foliage silvery-pubescent and sericeous. 160. *I. leucotricha*.
 Sepals not awned.
 Foliage densely pubescent.
 Pubescence shaggy; stems retrorsely hispid, blades hirsute, entire; sepals glabrous. 161. *I. signata*.
 Pubescence velvety or sericeous; blades entire or unequally 3-lobed; sepals sericeous. 162. *I. tuxtlensis*.
 Foliage glabrous or at least not densely hirsute sericeous. C.
 C. Stems stout and woody, often 2 cm. thick. West Indian. 163. *I. demerariana*.
 Stems slender, less than 1 cm. thick.
 Corolla salverform; blades subtriangular or ovate-lanceolate, more or less pilose. 164. *I. chenopodiifolia*.
 Corolla funnelform or campanulate-funnelform.
 Corolla white or yellowish-white.
 Leaf-blades oblong, rounded at the base. 166. *I. robinsonii*.
 Leaf-blades ovate, cordate or subcordate.
 Corolla 3.5 cm. long, yellowish-white with a magenta base, blades entire. 165. *I. curtissii*.
 Corolla 6-8 cm. long, white; blades entire or 3-lobed. 167. *I. dimorphophylla*.
 Corolla or corolla-limb blue or purple. D.
 D. Corolla 2-3 cm. long; sepals 4-5 mm. long. 168. *I. cardiophylla*.
 Foliage glabrous; sepals acute.
 Foliage more or less pubescent at least when young.
 Peduncles longer than the leaves.
 Inflorescence 5 cm. long or less; corolla minutely pubescent without, white below. 169. *I. perlonga*.

- Inflorescence 10 cm. long; corolla glabrous, entirely purple; blades often 3-lobed. 171. *I. umbraticola*.
- Peduncles shorter than the leaves; sepals mucronulate; stems, petioles and peduncles finely pubescent, with weak tentacular-like outgrowths. 170. *I. parasitica*.
- Corolla 4-6 cm. long or longer.
- Foliage thin and glabrous; pedicels hollow and wand-like.
- Pedicels 2-3 cm. long; corolla 5-6 cm. long. 172. *I. violacea*.
- Pedicels 4-6 cm. long; corolla 8-10 cm. long. 173. *I. pedicellaris*.
- Foliage firm-textured; pedicels not hollow or wand-like.
- Corolla white with a purple throat; peduncles 1-2-flowered. 174. *I. wallii*.
- Corolla blue or purple; blades cordate-sagittate or cordate-hastate. 175. *I. morelii*.
149. ***Ipomœa sagittata*** Lam. Illus. 1: 466. 1791.—Cav. Ic. 2: 4. pl. 107. 1793.—Choisy in DC. Prodr. 9: 372. 1845.—A. Gray, Syn. Fl. N. Am. 2¹: 212. 1878.

Convolvulus speciosus Walt. Fl. Car. 93. 1788. Not *C. speciosus* L. f. 1781.
Convolvulus wheeleri Vahl, Symb. Bot. 2: 36. 1791.
Convolvulus formosus Gmel. Syst. 1: 343. 1796.
Convolvulus sagittifolius Michx. Fl. Bor.-Am. 1: 138. 1803.
Ipomœa sagittæfolia Ker. Bot. Reg. pl. 436. 1820.
Fraxima sagittifolia Raf. Fl. Tellur. 4: 83. 1838.
Ipomœa heterophylla G. Don, Gen. Syst. 4: 274. 1838.
Ipomœa diversifolia F. Dietr. in Kjoeb. Vidensk. Meddel. 221. 1854.
Ipomœa speciosa Hallier f. Bot. Jahrb. 18: 143. 1894.—Small, Fl. 962. 1903.
 Not *I. speciosa* Pers. 1805.

TYPE LOCALITY: Carolina. (Walt.)

DISTRIBUTION: Marshes and fields near the coast, North Carolina to northern Mexico, Bermuda, Bahamas, Cuba and the Mediterranean region.

150. ***Ipomœa polyanthes*** Roem. & Schult. Syst. 4: 234. 1819.

Convolvulus americanus, vulgaris folio, capsulis triquetris numerosis, Pluk. Alm 114. pl. 167. f. 1.
C. luteus polyanthos, Plum. Am. 88. pl. 102.
C. polyanthos, folio subrotundo, flore luteo, Sloan. Jam. 55.
Convolvulus umbellatus L. Sp. Pl. 155. 1753.—Desr. in Lam. Encyc. 3: 555. 1789.
Convolvulus multiflorus Mill. Dict. No. 15. 1768.

- Ipomœa umbellata* G. F. W. Mey. Prim. Fl. Esseq. 99. 1819. Not *I. umbellata* L. 1759.
Convolvulus sagittifer H. B. K. Nov. Gen. & Sp. 3: 100. 1819.
Ipomœa multiflora Roem. & Schult. l. c. Not *I. multiflora* Roxb. 1814.
Convolvulus caracasanus Roem. & Schult. l. c. 301.
Convolvulus millerianus Roem. & Schult. l. c. Index 821.
Ipomœa primulaefolia G. Don, Gen. Syst. 4: 270. 1838.
Ipomœa sagittifer G. Don, l. c. 273.
Fraxima umbellata Raf. Fl. Tellur. 4: 83. 1838.
Convolvulus densiflorus Hook. & Arn.-Bot. Voy. Beech. 303. 1841.
Convolvulus luteus Mart. & Gal. Bull. in Acad. Brux. XII. 2: 260. 1845.
Ipomœa mollicoma Miq. Stirp. Surinam Select. 132. pl. 37. 1850.
Merremia umbellata Hallier f. Bot. Jahrb. 16: 552. 1893;—18: 114. 1894.

TYPE LOCALITY: Martinique Domingo, Jamaica (Linn.).

DISTRIBUTION: Florida Keys, West Indies, western and southern Mexico and Central America to Brazil, Bolivia and Paraguay.

151. *Ipomœa longipes* Garcke, in Linnaea 22: 66. 1849.—Meissn. in Mart. Fl. Bras. 7: 268. 1869.

Similar to *I. polyanthes*, but the stems densely hirsute; sepals unequal, ciliate, 7-10 mm. long; corolla 4-5 cm. long.

TYPE LOCALITY: Near Poelebantje, Brazil.

DISTRIBUTION: Central America to Brazil.

SPECIMENS EXAMINED: Guatemala; Coban, *H. von Tuerckheim* (J. Donnell Smith 1437), 1888 (Y, N).

152. *Ipomœa trichocarpa*, Ell. Bot. S. C. & Ga. 1: 258, 1817.¹

Convolvulus folio hederaceo, arvensis, flore dilute purpureo, Dill. Hort. Elth. 100. pl. 84. f. 98.

Convolvulus carolinus L. Sp. Pl. 154. 1753.

Ipomœa carolina Pursh, Fl. Am. Sept. 1: 145. 1814. Not *I. carolina* L. 1753.

Ipomœa commutata Roem. & Schult. Syst. 4: 228. 1819.—A. Gray, Syn. Fl. N. Am. 2¹: 213. 1878.

Ipomœa caroliniana Pursh; Small, Fl. Southeastern U. S. 963. 1903.

TYPE LOCALITY: Carolina.

DISTRIBUTION: South Carolina to Florida, Kansas, Texas and Mexico. Reported throughout tropical America.

¹ J. H. Barnhart, Bull. Torrey Club 28: 680. 1901, on the dates of Elliot's Flora.

153. *Ipomœa triloba* L. Sp. Pl. 161. 1753.—A. Gray, Syn. Fl. N. Am. 2¹: 213. 1878.—Small, l. c. 963.

Ipomœa eustachiana Jacq. Obs. 2: 12. 1767.

Convolvulus trilobus Desr. in Lam. Encyc. 3: 564. 1789.

Ipomœa clausa Rudol.; Ledeb. in Schrad. Neues Jour. 2: 292. 1807.

Ipomœa parviflora Vahl, Symb. 3: 34. 1794.—Lunan, Hort. Jam. 1: 402. 1814.

Convolvulus dentatus Blanco, Fl. Filip. 89. 1837.

Amphione lobata Raf. Fl. Tellur. 4: 79. 1838.

Quamoclit triloba G. Don, Gen. Syst. 4: 259. 1838.

Quamoclit eustachiana G. Don, l. c.

Convolvulus subquinelobus Rees, Cyclop. No. 38. 1819.

Ipomœa galapagensis Anderss. in Vet. Akad. Handl. Stock. 1853: 213. 1855.

Ipomœa blancoi Choisy in DC. Prodr. 9: 389. 1845.

Ipomœa commutata Naves, in Fl. Filip. ed. 3. pl. 31. 1877.

Ipomœa leucantha Baker, Fl. Maurit. 208. 1877. Not *I. leucantha* Jacq. 1788.

Ipomœa batatas Usteri, Viertel. Naturf. Ges. Zurich 50: 122. 1905.

Convolvulus heterophyllus Moc. & Sesse, Fl. Mex. in La. Naturaleza II. 2: Append. 36. 1893.

TYPE LOCALITY: Jamaica (Sloane). America (Linn.).

DISTRIBUTION: Dry or sandy thickets, peninsular Florida, Bahamas and West Indies, Arizona to Central America and Brazil and the Philippine Islands.

ILLUSTRATIONS: Sloane Jam. pl. 97. f. 1. Jacq. Obs. pl. 36.

154. *Ipomœa ramoni* Choisy in DC. Prodr. 9: 380. 1845.

Closely resembling *I. triloba*; calyx broadly campanulate; sepals unequal, abruptly acuminate and setaceous, 4–7 mm. long, outer ones densely ciliate and pubescent; corolla broadly funnelform, 1.75–2 cm. long or longer, the limb as broad, pinkish-purple.

TYPE LOCALITY: Near Havana, Cuba.

DISTRIBUTION: Cuba.

SPECIMENS EXAMINED: Guanajay, Curtiss 632, 1905 (Y); Havana, Hermann 3117, 3883, 1905, (Y); Baker 3680 3847, 3986, 1904 (Y); Wilson 3640, 1904 (Y); Baker & Wilson 3875, 1904 (Y). Holquin, Bacajagua, C. Wright 3085, 1860–64 (G).

155. *Ipomœa lacunosa* L. Sp. Pl. 161. 1753.—A. Gray, Syn. Fl. N. Am. 2¹: 213. 1878.—Britton, Manual 752. 1901.—Small, Fl. Southeastern U. S. 963. 1903.

Convolvulus stellatus, periplocæ rotundioris folis, Dill. Hort. Elth. 103. pl. 87. f. 103.

Convolvulus lacunosus Spreng. Syst. 1: 597. 1825.

Convolvulus micranthus Riddell, Syn. Fl. W. St. 70. 1835.

TYPE LOCALITY: Carolina.

DISTRIBUTION: Moist thickets, Pennsylvania to South Carolina, west to Illinois, Mississippi and Texas.

156. *Ipomœa trifida* (H. B. K.) G. Don, Gen. Syst. 4: 280. 1838.—A. Gray, Syn. Fl. N. Am. 2¹: 212. 1878.—Small, l. c. 963.

Convolvulus trifidus H. B. K. Nov. Gen. & Sp. 3: 107. 1819.

Convolvulus hepaticifolius Willd.; Roem. & Schult. Syst. 4: 303. 1819.

TYPE LOCALITY: In woods along the Orinoco river, between Carichana and San Borja, Venezuela.

DISTRIBUTION: Southern Louisiana and Texas to Central and South America. Also in the West Indies.

Ipomœa trifida (var.) *torreyana* A. Gray, l. c.

Ipomœa commutata Torr. Bot. Mex. Bound. 149. 1859.

Western and southern Texas to western Mexico.

Ipomœa trifida (var.) *berlandieri* A. Gray, l. c.

Central and southern Texas.

Ipomœa trifida ymalensis var. nov.

Glabrous, twining; leaf-blades ovate, entire or shallowly 3-lobed or angled, cordate or cordate-hastate, acuminate, thin, pale-green beneath; peduncles elongated, stout, 3-many flowered; sepals oblong-lanceolate, 9–11 mm. long; corolla less than 2 cm. long.

MEXICO: Ymala, *Palmer 1746*, 1891 (type—Y, N); *Palmer 1708*, 1891 (Y, N).

157. *Ipomœa peninsularis* Brandegee, Zoe, 5: 168. 1903.

Slender, twining from a perennial, tuberous root, pubescent; leaf-blades ovate, acuminate, deeply cordate, basal sinus often closed and clasping the stem in young leaves, 5–6 cm. long; peduncles 3–6 cm. long, 1- to 3-flowered; sepals ovate, 4–5 mm. long, glandular-muricate; corolla about 15 mm. long, pale-violet.

TYPE LOCALITY: Western slopes of the Cape region, Lower California.

DISTRIBUTION: Lower California and western Mexico.

SPECIMENS EXAMINED: Lower California, *Brandegee*, 1902 (N). Jalisco; *Barcena 553*, 1887 (M).

158. *Ipomœa batatas* (L.) Lam. Encyc. 6: 14. 1804.—Willis, Prac. Fl. 183. 1894.

Convolvulus batatas L. Sp. Pl. 154. 1753.

Convolvulus edulis Thunb. Fl. Jap. 84. 1784.

Ipomœa catesbetei G. F. W. Mey, Prim. Fl. Esseq. 113. 1818.

Convolvulus esculentus, *batata* and *varius* Vell. Fl. Flum. 2: 73. 1827.

Batatas edulis Choisy in Mém. Soc. Phys. Genève. 6: 435. 1845.—In DC. Prodr. 9: 1845.

Convolvulus chrysorrhizus Forst.; Wien. Illustr. Gartenz. 288. 1888.

TYPE LOCALITY: Asia, Africa, America (Linn.).

DISTRIBUTION: Circumtropical, chiefly as a cultivated plant. Arkansas to Texas, Florida and Mexico to South America. SWEET POTATO.

ILLUSTRATIONS: Catesb. Car. pl. 60. Moris. Hist. 2: pl. 3. f. 4. Rumph. Amb. pl. 130. Rheed. Mal. 11: pl. 50. Dill. Elth. pl. 80. f. 91, 92; pl. 81, f. 93; pl. 82, f. 94; pl. 83, f. 95, 96. Vell. Fl. Flum. 2: pl. 55, 58, 59, 61.

Apparently derived by cultivation from the next species and doubtfully distinct from it.

159. *Ipomœa tiliacea* (Willd.) Choisy in DC. Prodr. 9: 375. 1845.—Hallier f. Bull. Soc. Bot. Belg. 37: 95. 1898.

? *Convolvulus plataniifolius* Vahl, Symb. 3: 26. 1794.

Convolvulus tiliaceus Willd. Enum. 1: 203. 1809.—Schlecht. in Linnaea 6: 739. 1831.

Convolvulus fastigiatus Roxb. Hort. Beng. 13. 1814.

Ipomœa cymosa G. F. W. Mey. Prim. Fl. Esseq. 99. 1818.

? *Ipomœa plataniifolia* Roem. & Schult. Syst. 4: 220. 1819.

Convolvulus essequibensis Spreng. Syst. 1: 600. 1825.

Ipomœa fastigiata Sweet, Hort. Brit. 288. 1826. Choisy in DC. Prodr. 9: 380. 1845.

Ipomœa hirsuticaulis C. H. Wright, Kew Bull. 162. 1896.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Florida Keys and West Indies, southern Mexico to Bolivia, Peru and Brazil.

160. *Ipomœa leucotricha* J. Donnell Smith, Bot. Gaz. 23: 10. 1897.

Perennial; densely silvery-pubescent or sericeous; leaf-blades orbicular, 6–10 cm. broad, cordate, entire, acute, sparingly pilose above, silvery beneath; peduncles many-flowered, cymes 3–4 times dichotomous, corymbiform; sepals oblong-ovate, 6 mm. long, the awned apex recurved; corolla 5–6 cm. long, canescent in bud.

TYPE LOCALITY: Newton, Guatemala.

DISTRIBUTION: Guatemala.

SPECIMENS EXAMINED: Newton, *Nelson 3512*, 1895 (type—N).

161. *Ipomœa signata* House, Muhlenbergia 3: 46. 1907.

Stout, perennial; stems and foliage densely pubescent or hirsute; stems retrorsely hirsute and terete; leaf-blades ovate, cordate, acute, 4-6 cm. long; peduncles 8-12 cm. long, 1- to 3-flowered; calyx glabrous; sepals ovate, 9-10 mm. long; corolla crimson, 6-7 cm. long, glabrous.

TYPE LOCALITY: Between Jacaltenango and San Martin, Guatemala.

DISTRIBUTION: Known only from the type locality.

SPECIMENS EXAMINED; *E. W. Nelson* 3595, 1895 (type — 252762 — N).

162. *Ipomœa tuxtliensis* sp. nov.

A slender, perennial, twining vine, 2-3 m. long, softly pubescent; leaf-blades ovate, cordate, acuminate, entire or more or less 3-lobed, 5-8 cm. long, nearly as broad, softly appressed-pubescent above, sericeous or silvery beneath; petioles shorter than the blades; inflorescence subsessile on peduncles 4-8 mm. long, 3- to 7-flowered; bracts linear-spatulate, 8-18 mm. long; pedicels 4-5 mm. long or less; sepals subequal, oblong-ovate, outer ones densely sericeous-pubescent, rounded at apex, inner ones glabrous or nearly so, submembranaceous, retuse at apex, 10-12 mm. long; corolla deep purple, 3.5-5 cm. long, the limb 3-4 cm. broad and 5-lobed.

MEXICO: Chiapas, Tuxtla, 2400-2800 ft. alt. *E. W. Nelson* 3094, 1895 (type — 234042 — N); 3102, 1895 (233069 — N, G).

163. *Ipomœa demerariana* Choisy in DC. Prodr. 9: 361. 1845.—
Griseb. Fl. Br. W. Ind. 471. 1861.

Leaf-blades orbicular, deeply cordate, acute, 8-16 cm. broad; peduncles 10-20 cm. long, 3-several flowered; sepals 15-18 mm. long; corolla purple (yellow fide Choisy), 5-8 cm. long, funnelform; anthers contorted.

TYPE LOCALITY: Demerara.

DISTRIBUTION: Lesser Antilles, Guiana and Brazil.

SPECIMENS EXAMINED: Dominica; *Lloyd* 241, 633, 932, 1903 (Y). Guadeloupe; *Duss* 4026, 1899 (Y). Martinique; *Duss* 4102, 4402, 1899 (Y).

164. *Ipomœa chenopodiifolia* (Mart. & Gal.) Hensley, Biol. Cent.-
Am. Bot. 2: 385. 1882.

Calonyction chenopodiifolium Mart. & Gal. Bull. in Acad. Brux. XII. 2: 269. 1845.
— Walp. Rep. 6: 531. 1847.

The perennial stems woody, muricate or tuberculate, hirsute with reflexed hairs; leaf-blades 8-12 cm. long, about 5 cm. broad, pilose beneath and on the veins above, the base hastate with a broad open sinus: petioles short; peduncles shorter than the petioles, pilose, 3-4 cm. long, 1-flowered; sepals ovate, obtuse, apiculate, glabrous; corolla purple, 5-8 cm. long.

TYPE LOCALITY: Oak woods, Juquila, Mexico (*Galeotti 1375*). Not known by any recent collections.

165. *Ipomœa curtissii* sp. nov.

Slender, twining, 1-2 m. long, finely and densely pubescent or canescent; leaf-blades ovate, entire, cordate, acute, 2-5 cm. long and as broad, or broader, glabrous or nearly so; petioles usually shorter; peduncles rarely longer than the petioles, 1- to 5-flowered; pedicels 15-20 mm. long and slightly thickened, recurved in fruit; sepals subequal, greenish, puberulent, scarious-margined, ovate, acute, 5-6 mm. long; corolla yellowish with a magenta base, funnelform, about 4 cm. long, the sub-entire limb as broad; capsules ovoid, acute, about 12 mm. long, 2-celled; seeds glabrous.

CUBA: Havana, *Curtiss 562*, 1904 (type — Y, G). PANAMA: Santa Rita Trail, *Cowell 166*, 1905 (Y).

Apparently differing from *I. obscura* Ker. only by its larger sepals and larger corolla of a more decided yellow.

166. *Ipomœa robinsonii* sp. nov.

A slender, glabrous, twining vine with zig-zag leafy branches; leaf-blades elliptical-oblong, rounded at base, apex obtuse or subacute, 6-8 cm. long, 2-4.5 cm. broad, punctate; petioles 1-2 cm. long; peduncles 1-flowered, less than 2 cm. long, the two large yellowish-green bracts elliptical-lanceolate and acute, tapering to the base; sepals orbicular-ovate, rounded at apex, 7-9 mm. long; corolla slender funnelform, 6-8 cm. long, white, the limb 3.5-4 cm. broad, with 5 rounded lobes; stamens nearly as long as the corolla; capsules ovoid, 1 cm. long, apiculate.

MEXICO: Morelos; Lava beds near Cuernavaca, *Pringle 7338*, 1896 (type — G).

Named in honor of Dr. B. L. Robinson, curator of the Gray Herbarium of Harvard University.

167. *Ipomœa dimorphophylla* Greenm. in Proc. Am. Acad. 33: 482. 1898.

Slender, perennial below, more or less pubescent with fine hairs; leaf-blades ovate-oblong, 4-10 cm. long, 3-8 cm. broad, shallowly cordate, acuminate, entire or variously 3-lobed, more or less pubescent beneath; peduncles shorter than the petioles, 1-several flowered; sepals thick and coriaceous, obtuse, 6-7 mm. long; corolla white, 6-8 cm. long.

TYPE LOCALITY: Near Cuernavaca, Morelos, Mexico.

DISTRIBUTION: Morelos and Oaxaca, Mexico.

SPECIMENS EXAMINED: Cuernavaca, *Pringle 6658*, 1897 (type — G, N,

Y); 7241, 1896 (G); 13779, 1906 (G). *Deam* 59, 1900 (G). Oaxaca: *Conzatti & Gonzalez* 505, 1897; 968, 1895 (G); *Pringle* 5677, 1894 (G).

168. *Ipomœa cardiophylla* A. Gray, Syn. Fl. N. Am. 2¹: 213. 1878.

Glabrous; leaf-blades ovate, hastate-cordate, 5–8 cm. long, thin; sepals ovate, acute, green with white scarious margins, 4–5 mm. long; corolla blue with a white tube 2–3 cm. long; capsules ovoid.

TYPE LOCALITY: Near El Paso, Texas.

DISTRIBUTION: Rocky places, western Texas to Arizona and northern Mexico, south to Oaxaca.

SPECIMENS EXAMINED: Texas; *C. Wright* 511 (type — G). Chihuahua; *Pringle* 617, 1885 (G). Coahuila; *Palmer* 904, 1880, (G, N). Oaxaca; *Rev. L. C. Smith* 847, 1895 (G); *Gonzalez & Conzatti* 898, 1898 (G).

169. *Ipomœa perlonga* Robinson, Proc. Am. Acad. 29: 319. 1894.

Young foliage minutely silvery-pubescent, stems with or without prickles; leaf-blades orbicular-ovate, cordate, acute, 3–10 cm. broad, more or less strigillose-pubescent, paler beneath; peduncles 15–30 cm. long, 5- to 15-flowered; pedicels slightly thickened and deflexed in fruit, 6–15 mm. long; sepals 4 mm. long, obtuse; corolla 4 cm. long, minutely pubescent without on the plicæ.

TYPE LOCALITY: Tequila, Mexico.

DISTRIBUTION: Lower California and western Mexico to Central America.

SPECIMENS EXAMINED: Tequila, *Palmer* 4519, 1893 (type — G, N, C).

170. *Ipomœa parasitica* (H. B. K.) G. Don, Gen. Syst. 4: 275. 1838.

Convolvulus parasiticus H. B. K. Nov. Gen. & Sp. 3: 103. 1819.

Convolvulus circinnatus Willd.; Roem. & Schult. Syst. 4: 302. 1819.

Stems glabrous or finely pubescent in lines, with a few weak recurved prickles; leaf-blades orbicular-ovate, 6–8 cm. long, the apex often acuminate, minutely pubescent above, less so beneath; peduncles shorter than the petioles 5- to 9-flowered; sepals 4–5 mm. long, outer ones subacute and minutely cuspidate, pubescent, inner ones rounded; corolla silvery-canescens in bud, about 3 cm. long, pubescent without on the tube.

TYPE LOCALITY: Near Caracas, Venezuela.

DISTRIBUTION: Southern Mexico to Venezuela.

SPECIMENS EXAMINED: Costa Rica; Nicoya, *Tonduz* 13679, 1900 (Y). San Jose, *Tonduz* 1561, 1893 (G). Guatemala; Santa Rosa, *Heyde & Lux*. (J. Donnell Smith 4024), 1892 (G).

171. *Ipomœa umbraticola* sp. nov.

Perennial; stems furrowed, twisted below, glabrous; leaf-blades ovate, entire or usually 3-lobed, cordate, 6–10 cm. long, nearly as broad, with some minute hispidulous pubescence above, glabrous or nearly so beneath, middle lobe oblong, acuminate, lateral lobes spreading, acute, subtriangular; petioles filiform, shorter than the blades; peduncles stout, longer than the leaves, angled, 10–15 cm. long, cymosely many-flowered; pedicels 1–2 cm. long; sepals glabrous, flavescent, subequal, 4.5–5 mm. long, suborbicular, imbricated, retuse and mucronulate; corolla funnellform, 4 cm. long; capsules ovate, obtuse, 7–8 mm. long, 2-celled; seeds glabrous.

COSTA RICA: Nicoya, *Tonduz 13677* (ex Herb. *H. Pittier*), 1900 (type — Y).

172. *Ipomœa violacea* L. Sp. Pl. 161. 1753.

Ipomœa foliis cordatis integerrimis, floribus confertis, corallis indivisis, Sauv. Monsp. 114.

Quamoclit foliis amplissimis cordiformibus, Plum. Sp. 3; Am. pl. 93. f. 1. Sloan. Jam. 55. Hist. 1: 155. pl. 98. f. 1.

Convolvulus indicus Mill. Dict. No. 5. 1768.

Ipomœa tricolor Cav. Ic. Pl. Rar. 3: 5. pl. 208. 1794.

Convolvulus violaceus Spreng. Syst. 1: 399. 1825.

Convolvulus venustus Spreng. l. c.

Ipomœa rubrocœrulea Hook. Bot. Mag. pl. 3297. 1834.

Pharbitis violacea Bojer, Hort. Maurit. 227. 1837.—Choisy in DC. Prodr. 9: 344. 1845.

Tereietra violacea Raf. Fl. Tellur. 4: 124. 1838.

Ipomœa hookeri G. Don, Gen. Syst. 4: 274. 1838.

Pharbitis rubrocœruleus Planch. Fl. des Serres 9: 281. pl. 966. 1854.

Convolvulus rubrocœruleus D. Dietr. Syn. Pl. 1: 670. 1839.

Ipomœa puncticulata Benth. Bot. Voy. Sulph. 136. 1845.—S. Wats. in Proc. Am. Acad. 22: 440. 1887.

Peduncles hollow and wand-like, longer than the petioles; leaf-blades ovate, cordate, often early deciduous; pedicels 2–3 cm. long; sepals 5–6 mm. long, greenish with white, scarious margins; corolla 5–6 cm. long, violet-blue or purple with a white tube.

TYPE LOCALITY: Habitat in America meridionali.

DISTRIBUTION: Western Mexico to Central America, Antilles and tropical South America.

SPECIMENS EXAMINED: Guanajuato, *A. Duges 4, 23*, 1904 (G). Oaxaca; *E. W. Nelson 1311*, 1894 (N, G); *L. C. Smith 300*, 1894 (G); *Mrs. D. H. Sheldon*, 1893 (G); Morelos; Cuernavaca, *Borgeau 1405*, 1865 (G). Costa Rica; San Jose, *Tonduz 7181*, 1892 (G). Jalisco; Chapala, *Palmer 702*, 1886 (N, C); Puebla; Near Tehuacan, *Rose & Rose 11441*, 1906 (N, Y); Yucatan; *Gaumer 329* (Y).

Guadeloupe; *Duss* 3591, 1894 (Y); Antigua; *Duss* 3, 1902.

Guatemala; Santa Rosa, *Heyde & Lux.* (ex J. Donnell Smith, 4352), 1892 (G).

173. *Ipomœa pedicellaris* Benth. Bot. Voy. Sulph. 135. 1844.—Walp. Rep. 6: 533. 1847.

Ipomœa rubrocœrulea A. Gray, Proc. Am. Acad. 21: 434. 1886. Not *I. rubrocœrulea* Hook. 1834.

Ipomœa grayi Rose, Contr. U. S. Nat. Herb. 1: 107. 1891.

Leaf-blades broadly ovate, 6–10 cm. long, shallowly cordate or subtruncate, entire, acuminate; peduncles 4–6 cm. long, 1-several flowered; pedicels as long as the peduncle, thickened, curved; sepals oblong-ovate, unequal, obtuse, 6–8 mm. long; corolla purple.

TYPE LOCALITY: Acapulco, Mexico, and Tiger Island, Gulf of Fonseca.

DISTRIBUTION: Western Mexico.

SPECIMENS EXAMINED: Sonora; *Schott*, 1855 (C). Ymala, *Palmer* 1704, 1891; 1997a, 1902; 710, 1890. Tepic, *Palmer* 1997, 1892. Chihuahua, *Palmer* 102, 1885 (N, C, G). Sinaloa; *Lamb* 359, 1894 (G); *Brandegee*, 1904 (G). Guerrero; Acapulco, *Palmer* 154, 1894–96 (N, G, C).

174. *Ipomœa wallii* (Morren) Hemsley, Biol. Cent.-Am. Bot. 2: 396. 1882.

Batatas wallii Morren, in Ann. Soc. d'Argic. Bot. Gand. 2: 285. 1846. Walp. Rep. 6: 530. 1847.

Perennial from a tuberous root; glabrous, swollen at the nodes and bearing tentacular outgrowths on both sides of the node; petioles stout, leaf-blades ovate, cordate, acute, 7–15 cm. long; sepals ovate, acute; peduncles shorter than the petioles.

TYPE LOCALITY: Guatemala. Not known by any recent collections in American herbaria. Exact relationship doubtful.

175. *Ipomœa morelii* Duchass. & Walp. Linnaea 23: 752. 1850.—Walp. Ann. Bot. Syst. 3: 109. 1852–53.

Perennial, glabrous, twining 1–4 m. long; leaf-blades narrowly ovate, deeply cordate, long acuminate, 6–9 cm. long, 3–6 cm. broad, hastately lobed at the base or entire, lobes laterally acute, basally rounded, pale beneath; petioles shorter than the blades; peduncles as long as the petioles or longer, 3–7 cm. long, 1- to 5-flowered; pedicels slightly thickened, 1–2 cm. long; sepals subequal, glabrous, oblong-ovate, 5–8 mm. long, the outer slightly the shortest, obtuse; corolla 5–6 cm. long, white below, the tube constricted within the calyx, the limb deep-blue, 4–5 cm. broad, 5-lobed.

TYPE LOCALITY: Panama.

DISTRIBUTION: Southern Mexico to Colombia.

SPECIMENS EXAMINED: Chiapas: Between Hacienda Juncana and San Vicente, 4200–6000 ft. alt. E. W. Nelson 3499, 1895 (252747 — N); Between San Cristobal and Teopisca, 6700–8500 ft. alt. E. W. Nelson 3479, 1895 (N). Referred to *I. morelii* by description only. The above description applies to the specimens here cited which may not be *I. morelii*.

Species Inquirendæ.

- Ipomœa apiculata* Mart. & Gal. in Bull. in Acad. Brux. XII. 2: 262. 1845.—
Walp. Rep. 6: 534. 1847.
aristulata Mart. & Gal. l. c. 263. Walp. l. c. 535.
costaricensis Kuntze, Rev. Gen. 443. 1891.
nematoloba Urban, Sym. Ant. 3: 349. 1902.
karwinskiana Regal, Ind. Sem. Hort. Petrop. 1857: 46. 1858.
lactescens Beuth. Pl. Hartw. 120. 1843.
pauciflora Mart. & Gal. l. c. 266.
proximum (Mart. & Gal.) Hemsley, Biol. Cent.-Am. Bot. 2: 392. 1882.
(*Calonyction proximum* Mart. & Gal. l. c. 263.)
schiedeana Ham. in Lindl. Bot. Reg. Misc. 19. 1838.
sericophylla Peter, in Engl. & Prantl. Nat. Pflanzenfam. IV. 3a: 31. 1891.
triflora Maria & Velasco, in La Naturaleza 2: 338. 1870.
truncata Lem. Hort. Univ. 2: 33. Pl. 49.
walpersiana Duchass.; Urb. l. c. 345.

Species excludendæ.

- Ipomœa ægyptia* L. Sp. Pl. 162. 1753. = *Operculina ægyptia* House.
alata Rose, Contr. U. S. Nat. Herb. 1: 108. 1891. = *Operculina rubicunda* House.
alatipes Hook. Bot. Mag. pl. 5330. 1862. = *Operculina alatipes* House.
alba L. Sp. Pl. 161. 1753. = *Calonyction album* (L.) House.
altissima (Spreng.) Bert.; G. Don, Gen. Syst. 4: 273. 1838. = *Exogonium racemosum* Choisy.
alulata Miq. Linnaea 18: 599. 1844. = *Operculina alata* (Ham.) Urban.
ampliata Choisy, DC. Prodr. 9: 361. 1845. = *Operculina ampliata* House.
antilliana Millsp. Field. Col. Mus. Bot. 2: 84. 1900. = *Turbina corymbosa* (L.) Raf.
arenaria Steud. Nom. ed. 2. 1: 815. 1841. = *Exogonium arenarium* Choisy.
argentifolium A. Rich. in Sagra Fl. Cub. 2: 131. 1850. = *Exogonium*.
aurea Kellogg; Curran, Bull. Cal. Acad. 1: 143. 1885. = *Operculina*.
bona-nox L. Sp. Pl. ed. 2. 228. 1762. = *Calonyction aculeatum* (L.) House.
bracteata Cav. Ic. 5: 51. 1799. = *Exogonium bracteatum* Choisy; G. Don.
bracteata Rud.; Ledeb. in Schrad. Neues Jour. Bot. 2: 292. 1807. = *Exogonium*.

- Ipomæa cincta* Roem. & Schult. Syst. 4: 254. 1819.= **Exogonium bracteatum** Choisy.
- coccinea* L. Sp. Pl. 160. 1753.= **Quamoclit coccinea** Moench.
- conzatti* Greenm. Field. Col. Mus. Bot. 2: 258. 1907.= **Exogonium**.
- corraliensis* Choisy, DC. Prodr. 9: 361. 1845.= **Operculina**.
- corymbosa* G. Don, Gen. Syst. 4: 274. 1838.= **Turbina corymbosa** Raf.
- desrousseauxii* Steud. Nom. Ed. 2, 1: 816. 1841.= **Exogonium eriospermum** Choisy.
- dissecta* Pursh, Fl. Am. Sept. 1: 145. 1814.= **Operculina dissecta** House.
- domingensis* (Desr.) House, Muhlenbergia 3: 38. 1907.= **Turbina corymbosa** (L.) Raf.
- eriosperma* Raf. Fl. Tellur. 4: 74. 1838.—Urb. Symb. Ant. 3: 350. 1902.= **Exogonium eriospermum** Choisy.
- filiformis* Jacq. Enum. Pl. Carib. 13. 1760.= **Exogonium filiforme** Choisy.
- fuchsoides* Griseb. Cat. Pl. Cub. 205. 1866.= **Exogonium**.
- funis* Cham. & Schlecht. Linnaea 5: 118. 1830.= **Quamoclit**.
- glaberrima* Boj. Hook. Jour. Bot. 1: 357. 1834.= **Calonyction album** (L.) House.
- globosa* Meissn. Mart. Fl. Bras. 7: 220. 1869.= **Quamoclit**.
- grandiflora* Roem. & Schult. Syst. 4: 240. 1819.= **Calonyction aculeatum** (L.) House.
- grandiflora* Hallier f. Bot. Jahrb. 18: 153. 1894.= **Calonyction album** (L.) House.
- hamiltoni* G. Don, Gen. Syst. 4: 268. 1838.= **Operculina alata** (Ham.) Urb.
- hastigera* H. B. K. Nov. Gen. & Sp. 3: 111. 1819.= **Quamoclit coccinea hederifolia** (L.) House.
- havanensis* Choisy, DC. Prodr. 9: 368. 1845.= **Jacquemontia havanensis** Urb.
- hederifolia* L. Syst. ed. 10. 925. 1759.= **Quamoclit coccinea hederifolia** (L.) House.
- jalapoides* Griseb. Cat. Pl. Cub. 202. 1866.= **Exogonium**.
- latiflora* Lindl. Bot. Reg. pl. 889. 1825.= **Calonyction aculeatum** (L.) House.
- leuconeura* Urb. Symb. Ant. 3: 350. 1902.= **Exogonium**.
- laveana* Meissn. l. c. 219.= **Quamoclit**.
- longiflora* Humb. & Bonpl.; Willd. Enum. 207. 1809.= **Calonyction aculeatum** (L.) House.
- luteola* Jacq. Ic. Rar. 1: pl. 35. 1781-86.= **Quamoclit coccinea** var. **luteola** Meissn. (*Quamoclit. lutea* Hemsley).
- megacarpa* Brandegee, Zoe 5: 218. 1905.= **Operculina ornithopoda** (Robinson) House.
- melanosticta* (Schlecht.) G. Don, l. c. 271.= **Rivia tiliaefolia** Choisy.
- microdactyla* Griseb. l. c. 204.= **Exogonium**.
- muricata* (L.) Jacq. Hort. Schoenb. 3: 40. 1798.= **Calonyction muricatum** G. Don.
- nuda* Peter; Engl. & Prantl. Nat. Pfl. VI. 3a: 31. 1891.= **Operculina tuberosa** (L.) Meissn.
- operculata* Mart.; in Spix. & Mart. Reise Bras. 2: 547. 1828.= **Operculina macrocarpa** (L.) Urban.

- Ipomæa ornithopoda* Robinson, Proc. Am. Acad. 27: 183. 1892.= **Operculina ornithopoda** House.
- palmeri* S. Wats. Proc. Am. Acad. 24: 63. 1889.= **Operculina palmeri** House.
- peduncularis* Bert. Fl. Guatem. 8. 1840.= **Quamoclit vitifolia** (Cav.) G. Don.
- pentaphylla* (L.) Jacq. Coll. 2: 297. 1788.= **Operculina ægyptia** (L.) House.
- perryana* Duch. & Walp. in Linnaea 23: 751. 1850.= **Thyella lactescens** (Seem.) House.
- præcox* Wright; in Sauv. Fl. Cub. 107. 1868.= **Exogonium**.
- pterodes* Choisy, DC. Prodr. 9: 361. 1845.—Griseb. Fl. Br. W. Ind. 313. 1861.= **Operculina alata** (Ham.) Urban.
- pterodes* Seem. Bot. Voy. Herald 171. 1857.= **Operculina alatipes** House.
- Quamoclit* L. Sp. Pl. 159. 1753.= **Quamoclit quamoclit** (L.) Britton.
- racemosa* Poir. Encyc. Suppl. 4: 633. 1816.= **Exogonium racemosum** Choisy.
- repanda* Jacq. Enum. Pl. Carib. 13. 1760.= **Exogonium repandum** Choisy.
- rhodocalyx* A. Gray, Proc. Am. Acad. 22: 439. 1887.= **Operculina rhodocalyx** House.
- rudolphii* Roem. & Schult, Syst. 4: 222. 1819.= **Exogonium**.
- serpyllifolia* (H. B. K.) G. Don, l. c. 267.= **Jacquemontia serpyllifolia** Urban.
- sidaefolia* Choisy, Mém. Soc. Phys. Genève. 6: 459. 1833.= **Turbina corymbosa** (L.) Raf.
- sinuata* Ort. Hort. Matr. Dec. 84. 1798.= **Operculina dissecta** (Jacq.) House.
- spicata* H. B. K. Nov. Gen. & Sp. 3: 112. 1819.= **Exogonium bracteatum** (Cav.) Choisy.
- spinulosa* Brandegee, l. c. 169.= **Calonyction muricatum** (L.) G. Don.
- steudeli* Millsp. l. c. 86.= **Exogonium arenarium** Choisy.
- tamnifolia* L. Sp. Pl. 161. 1753.= **Thyella tamnifolia** Raf.
- tastensis* Brandegee, l. c. 168.= **Calonyction tastense** House.
- tiliæfolia* (Lam.) Roem. & Schult. Syst. 4: 229. 1819.= **Rivia tiliæfolia** Choisy.
- triquetra* Roem. & Schult. l. c. 231.= **Operculina triquetra** (Vahl) Hallier.
- tuba* (Schlecht.) G. Don, l. c. 271.= **Calonyction album** (L.) House.
- tuberosa* L. Sp. Pl. 160. 1753.= **Operculina tuberosa** Meissn.
- ventricosa* (Bert.) G. Don, l. c. 274.= **Operculina ventricosa** Peter.
- versicolor* Meissn. Mart. Fl. Bras. 7: 220. 1869.= **Quamoclit**, (*Mina lobata* Llav. & Lax.; *Quamoclit mina* G. Don.).

